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Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

Vol. XIV, No. 4 | FEBRUARY, 1938 | $2.00 a Year

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Published by
Practical Publications, Inc., 222 East Ohio St., Indianapolis, Indiana

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Letters from Readers

OF INDUSTRIAL FINISHING

Editor's Note—These letters have been promptly answered and all of the inquiries have been referred to advertisers in the magazine. They are published here to indicate or suggest certain interesting trends of thought and activity in the industry, and to encourage further inquiries, comments and suggestions. The names and addresses of firms or individuals whose letters are published here may be had by writing to this office, or letters sent to them in care of this office will be forwarded at once.

Paint Like Chromium

We would appreciate your giving us the name and address of the manufacturer of the product (Paint Like Chromium) mentioned in your article on page nine of October issue of INDUSTRIAL FINISHING. — E. O. Co. (Commercial Finishers).

Will you kindly advise us the name of the manufacturer that makes the paint that is like chromium?—T. A. Corp. (Tacks).

Rust Proofing

Your November issue of INDUSTRIAL FINISHING called our attention to a rust-proofing compound, which was described further on page 7 in the Aug. issue. We have a rust problem which we would like to solve and would appreciate receiving information concerning this.—A. E. G. Co. (Stoves-Ranges-Heaters-Stokers).

A manufacturer specializing in this line advertises in INDUSTRIAL FINISHING every other month, see Nov. Jan. and Feb. issues.—Ed.

Finish Durability Tests

Mr. Rohr, may I tender my sincere congratulations to you and to Mr. Greggs Phillips on the article entitled, "Finish Durability Tests," starting on page 14 in the January issue. I am most heartily in accord with Mr. Phillips' opinions, and feel certain that presentation of such factual material, especially in the well written form offered in this article, should serve to deliver consumers from a great deal of misdirected zeal in the matter of elaborate but inconclusive tests.—W. T. SMITH.

Finishing Books

Do you sell or could you recommend a list of practical uptodate text books that could be used to improve my knowledge of the paint, varnish and lacquer industry? I am a salesman representing one of the large manufacturers in southern territory where I will be far away from headquarters most of the time. I call on the industrial trade as well as dealers, and I want to get all the education possible.—L. R. D.

Comments on Tumbling

I have before me today a copy of the December magazine and I must say it covers finishing very well. In reading many of the letters I find your information very valuable.

One writer asks: "Can you tell us a good method of finishing brass?" I note also a letter answering: "There are a number of ways to finish brass." But I doubt very much if one could afford to finish brass the way the letter suggests, on a production basis. It seems to me that

Coating small parts

USE THE **FILWHIRL** CENTRIFUGAL **ENAMELER**

Big savings can be made in finishing such items as small wood turnings, nuts, bolts, coil springs, hair pins, wood and metal toys, etc., by using the Barrett Centrifugal Coating Machine. It's faster, does a better job of finishing and saves materials. Already, a score of successful installations. Let us prove it! Send us samples of your products; we will finish them and return for your inspection. Do it TODAY!

THE LEON J. BARRETT CO.
Grafton Street, Worcester, Mass.

the writer has in mind small metal parts that he would like to finish to resemble brass. I would like to suggest to the writer of the article—also to other readers of this magazine—what thought are you giving to tumbling machine work?

Many problems can be solved in finishing small and large parts in tumbling barrels—when one considers that millions of parts can be finished on a mass production scale by this method.

A few materials used in tumbling are: Shellacs, lacquers, pigment colors, baking synthetics and many other colors. Tumbling is a modern up-to-date method and can be used for burnishing or polishing jewelry metal and gold and silver parts. Last but not least is celluloid. I believe many manufacturers will solve many problems by tumbling. I would suggest that other readers comment on tumbling.—R. Boon.

Smoothing the Finish

We are interested in getting all the information we can on a process of smoothing down an undercoat flat surface by means of revolving brushes before applying the final enamel coat. If you have any information in this regard, we would be very glad if you would pass it on to us.

P. S.—The paint is applied by a roller coating machine on a flat basswood surface. — E. E. Son & Co. (Window Shades, Venetian Blinds).

"Durolite" Again

We would appreciate your forwarding to us immediately the name of the paint company that manufactures the Duro-lite (or Durolite) enamel, designed particularly for commercial refrigerators. — N. I. O. (Baked Enameling, Lacquer Spraying).

Can some reader name the concern that makes this product? We have had several inquiries for it. —Ed.

Finishing Picture Frames

We have put in a shaped-frame department and would like to know what information you can pass on to us regarding whitening (white coating) these shaped frames, as well

(Continued on page 69)

PADDING LACQUER A 209 B

A padding finish applied by hand with swab or pad over finished furniture that has been marred or abrased.

Excellent for furniture that has been warehoused and requires retouching.

Can be used for patching and wooled off with steel wool about fifteen minutes after application.

We invite inquiries from jobbers of Industrial Finishing Materials.

Gloss or dull finishes are easily obtained.

Padding Lacquer A 209 B is a good fast hand refinishing material over old work.

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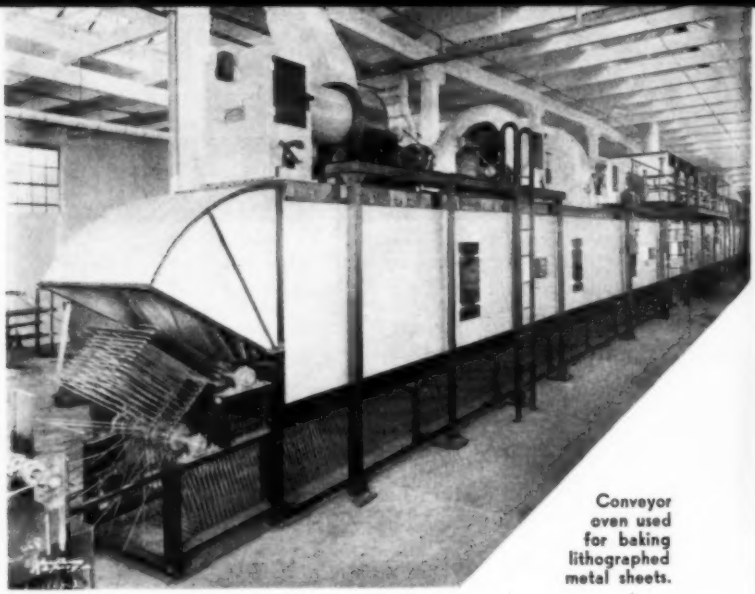
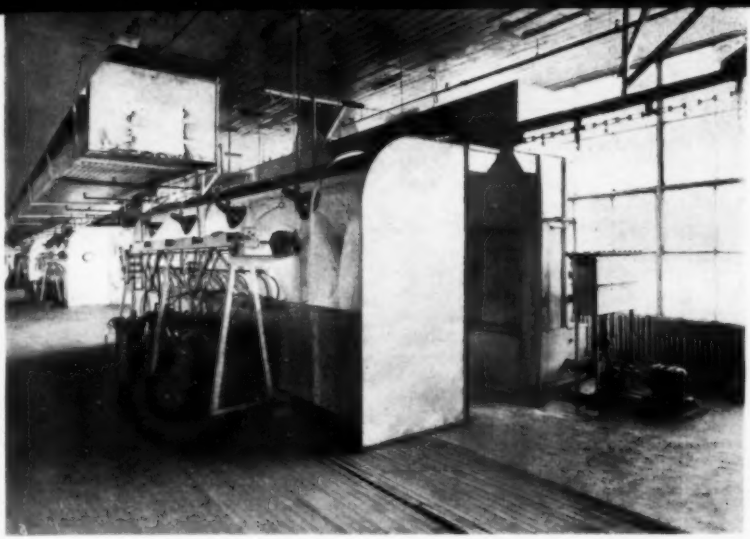


Conveyor oven used for baking lithographed metal sheets.

Review of Finishing-Room E

WHEN ONE OF THE MANUFACTURERS to whom we wrote for information about newly developed or improved finishing equipment replied, "I'm a little confused by what you mean by 'finishing equipment' and I'm wondering if any of the machines we manufacture are classified in such a group", we immediately realized that we should have used the more inclusive term "Finishing-Room Equipment", all of which interests finishers and their executives. For instance, drum handling rigs, air filters, solvent cleaners and meters for measuring the flow of finishing material; these can not be properly classified as "finishing equipment" but they and many other items are important in the finishing room. All of them are incidental to actual finishing.

Come to think of it, there are probably few men in the industry who fully realize what all can be properly included in finishing-room equipment. There is really an imposing list



A battery of hydro-filter spray booths for finishing automobile fenders and hoods. Note the perforated fresh air duct which provides clean conditioned air to the room.

Equipment That's New

of items which, if all catalogued between two covers, would make quite a large illustrated book.

First, there is equipment for performing essential operations directly preceding the actual application of any finish coatings. This is included because the proper preparation of surfaces to be finished—particularly metal surfaces—is absolutely necessary to make the finish satisfactory. Metal surfaces must be thoroughly cleaned—dry cleaned with rubbing abrasives or blast abrasives; or wet cleaned with chemical cleaners, followed by water rinsing and drying to remove all traces of the chemical. Surfaces that are not perfectly smooth—either metals or woods—usually must be made smooth by some form of rubbing abrasives such as sandpapering or steelwooling; and between coats there is usually a light sanding to the end that the final finished surface will be built up to a glass-like fullness and smoothness. Before

the final finish is applied the surface may be wiped clean of all dust and lint with a tack rag.

Now before we get into the actual application of liquid coatings such as primers, stains, sealers, fillers, paints, enamels, varnishes, lacquers, or synthetics, there is equipment for handling and conditioning these finishing materials. To name just a few of the items; drum hoists, drum tilters, drum periscopes for looking into drums, agitators or mixers, pumps, viscosimeters, strainers, gravity containers, pressure containers, pipe lines and accessories for continuous circulating systems, meters for measuring the flow of paint through a pipe line or hose, material hose, etc.

For actual application of the liquid coating materials we can include spray equipment of all kinds; likewise dipping equipment, centrifugal or whirling machines, roller coating machines and tumbling barrels — and along with each of these outfits the many special trays, baskets, racks, turntables and conveyors for making the application work rapid, continuous and economical. Back of that spray equipment, to make it function effectively, are compressors, air receivers, air lines, pressure gauges, regulators, filters, booths, ventilating fans and numerous other accessories.

Interesting and varied lines of equipment and supplies are available for producing special decorative effects—wood and marble graining equipment, silk screen stencils, stencil making tools, other types of stencils, masking tape, decalcomania transfers, striping tools, embossing outfits, etc.

Conditioning and treating the film of finishing material after application calls for such equipment as drying rooms, baking ovens, baking lamps, finish patching and finish repair tools and supplies, rubbing and polishing machines, and various other items. The cleaning and salvaging of materials, equipment and supplies is something that involves the possible use of solvent recovery stills, wiping-rag washers, drum and container cleaning devices and spray booth coatings.

For plant safety—fire extinguishers, self-closing steel doors and metal containers for waste. For safety of workmen—respirators, hoods, goggles, ventilating systems, paste for rubbing on hands and first-aid kits.

One of the outstanding new developments which our company has made in the past year, has been in the production of large-size heavy-duty lithograph ovens for baking heavy sheets going into the manufacture of pails and drums. There has been an increased demand for lithographed steel barrels and drums during the past year. Formerly the design on such drums was made by hand, either by a silk screen, or rubber stamp method, both of which had its limitations. New presses and coating machines have been developed to take care of the large size sheets necessary for drum work so that same type of work can be produced on these drums as is now produced on the smaller cans.

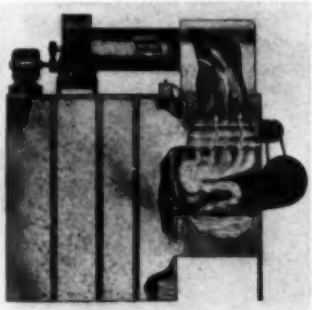
The unit which we have developed can be heated either by oil or gas and may be of the direct or indirect-fired system. In many localities where gas is fairly expensive, a cheap oil can be used in our indirect-fired oven, offering the user the advantage of low operating fuel costs.

Obviously, in this article we can only touch a few of the high spots among the many items that have been developed new or improved during the past year. Write, telephone or wire to INDUSTRIAL FINISHING for the names and addresses of manufacturers of products in which you are interested, or send your inquiries to this office to be forwarded.

Water-Wash Booths—Special booths, which cleanse exhausted air by the air-wash method, have been developed to prevent the discharge of heavy solid paint residues to the outside of the building. They make possible the operation of a booth in neighborhoods where standard fan or blower type booths would be prohibited and in locations where a suitable stack could not be installed. They are especially recommended where the booth exhausts close to other buildings.

Water-wash booths may be used when spraying any of the common materials, but they offer a particular advantage when such materials as primers and enamels are used where the residue is heavy and sticky.

A notable advantage of the water-wash spray booth is the reduction of cleaning costs, both inside and outside the building. Frequent cleaning of fan, pipe and stack is eliminated. Exterior appearance of the building requires less attention. Paint vapor does not work its way back into the plant to be caught in the fresh air intake filter.



Centrifugal type water-wash booth.

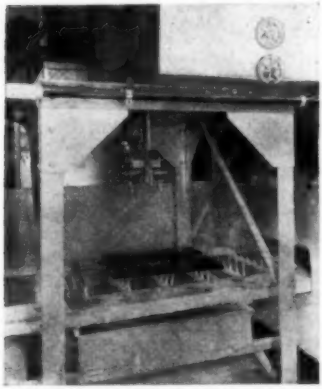
Most equipment manufacturers make an outfit similar to the rotary spray machine offered by one or more of the advertisers in I. F. I know several concerns who are daily reducing their finishing costs with such equipment.

Certain makes of water-wash spray booths are available in either the new centrifugal or the original conventional (pump and nozzle principle) types. Both types are designed to provide a maximum contact between the water and the outgoing vapor-laden air.

The new centrifugal water-wash spray booth is of exclusive design and development. This system, the manufacturer claims, uses less water than the pump and nozzle types. Because of the more intimate mixing of air and water and despite the fact that less water is used, the centrifugal type provides for a thorough washing.

Automatic Sprayer—The automatic spraying assembly consists of a moving sprayer head which has four spray nozzles of the type used on ordinary hand spray guns, adjusted to give a flat fan-shaped spray. In operation, the entire spraying assembly moves back and forth at a regulated rate of speed across the conveyor carrying the ware to be sprayed.

The spray is automatically shut off each time it crosses the work as soon as it reaches the edge, and is automatically turned on again as it reaches the edge on the return trip. Points at which the spray is turned off and on, may be adjusted for various widths of work. This operation, imitating hand spraying, saves material and prevents piling up of enamel



Sprays a uniform thickness coating automatically in down-draft spray booth.

on the nose of the gun, which may cause spitting.

The exhaust on the automatic spraying system is downdraft. Dust and fumes are pulled down away from the wet surface.

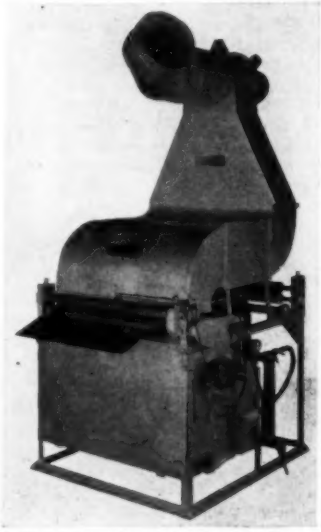
The machine is 36-ft. long, and is equipped with a conveyor which carries the work from loading end until it is unloaded after spraying.

In preparing the machine for operation it is necessary to adjust the speed of the conveyor and the speed of the spraying assembly until the desired weight of coat is applied, and for the width of work to be sprayed. The weight of application is measured in grams per square foot. Once this is adjusted the machine will give an absolutely uniform coating for hours at a time. The machine is usually readjusted when using a new supply of enamel. These adjustments require only a few seconds.

Sprays Automatically—A unit designed to apply a very light film of paraffin on lithographed metal sheets which are later fabricated into bottle caps. The purpose of this application is to lubricate the dies to prevent pulling off the varnish when stamping bottle caps. It is important, however, that only a very light application is made; otherwise, there is a tendency to gum up the dies, making it necessary to clean them frequently.

The unit consists of an electrically-heated material reservoir and spray chamber, both of which are properly insulated to retain heat. The paraffin is melted and maintained in a liquid state in this reservoir, by means of electric strip heaters built into the bottom. Temperatures are controlled by means of thermostat, so there is no danger of overheating or burning the paraffin.

Two automatic airbrushes are employed to supply a mist coating to the bottom side of the sheet. These guns are turned on by means of an electrically-operated feather contactor. The sheets are fed into this unit at the rate of three per second, with the guns shutting off and turning on automatically as each piece comes within range and again passes out of range.

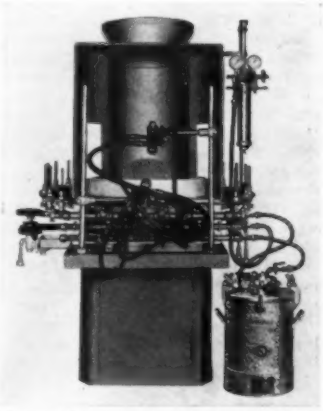


Sheets pass through between rollers

In the main, the improvements in equipment used for industrial finishing have been toward obtaining more uniformity of heat distribution and control in ovens of existing designs, and in the control of oven atmospheres. The latter factor is particularly important in view of newer types of synthetic finishes which are being used at the present time, which usage is on the rapid increase as new finishes are developed. It has been found that most of these finishes require much more critical control of temperatures and oven atmospheres than the older types. For this reason we have found that there has been increased demand among the larger users for ovens fired with an indirect heating system wherein all products of combustion are excluded from the oven atmosphere.

The overspray is exhausted by means of a specially designed ventilating hood and duct with a baffle and collector plates, and a patented fireproof ventilating unit. Absolute uniformity of application is obtained with a film as light or as heavy as may be desired by means of adjustment on the automatic airguns which are supplied with this unit.

Rotary Spray-Finishing Machine—This spray-finishing machine is equipped with spindles, automatic spray gun, automatic control valve, hose connections, etc. The machine is available in three sizes. The medium size machine, illustrated here, is capable of an approximate production up to 3600 small finished lightweight articles per hour. It has a speed reduction unit and may be operated at different speeds. If desired it can be provided with a cam so the spray gun operates at every second spindle when the machine is used for finishing larger articles. The turntable is independently motored and its speed is determined by the work to be done. Turntable will accommodate 15, 20, 25, 30, 40 and 50 spindles. The number of spindles is dependent upon the size of pieces to be sprayed. Exhaust chamber can be designed to meet the individual requirements, and the machine may be equipped with a drying oven if desired. A few of the more important features are: Adjustable cam controls spraying period, resulting in saving of material; auxiliary drive



For rapidly spray-finishing small articles on a production basis.

shafts are integral parts of reduction unit; rotating tables up to 60-in. diameter can be furnished; simplified header system can accommodate four guns.

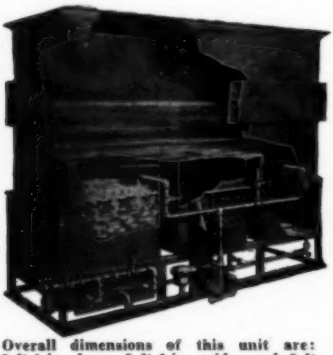
Three-Dip Detrex Degreaser—3-dip, hand-operated degreaser that consists essentially of three chambers separated by wide dams which act as heat insulators. The chambers, from left to right, are designated as: the boiling chamber, the rinse chamber, the vapor chamber. This permits a straight line sequence of cleaning operations.

The work, which is placed in large

perforated baskets, can be handled by hand or by means of a hoist, depending upon the weight of the load. Baskets, containing the work to be cleaned, are lowered into the boiling solvent in the first chamber where the heavy contamination is removed. The continuous sweep of the boiling solvent over the work gives a washing or scrubbing effect that assists in the removal of solid particles and caked-on materials.

After immersion in the first chamber, the work is placed in the second or rinse chamber. The temperature of the solvent in this chamber is lower than that of the boiling chamber and that of the vapor chamber—the temperature difference being maintained by the open air space in the dam separating the chambers. Immersing the work in the cool rinse lowers its temperature and, at the same time, flushes it. A final cleaning, reheating and drying are effected by placing the work in the third or vapor chamber. The work emerges from this chamber clean, warm and dry—ready for subsequent operations. The entire cleaning cycle requires but a few minutes time at the most.

The water jacket and solvent-collecting trough, which can be seen in the illustration, completely encircle the machine. The vapors, which condense at the level of the water jacket, are collected in the trough and returned to the rinse chamber. This arrangement insures a continuous supply of clean solvent condensate for rinsing the work.



Overall dimensions of this unit are: 7-ft.1-in. long, 3-ft.6-in. wide, and 5-ft 6-in. high. Solvent capacity, 123 gallons.

Several concerns have recently offered improved cleaning equipment that deserves mention. Cleaning is an operation that more concerns are paying more attention to. They are beginning to realize that it is almost impossible to get a good finish on uncleaned metal.

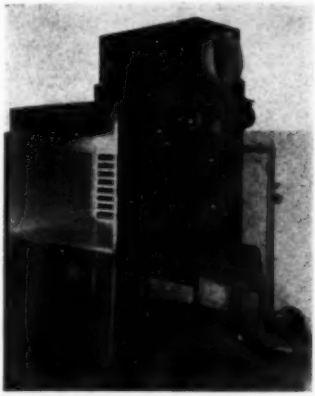
The machine is equipped with a vapor actuated, air-operated control system, consisting of thermostat temperature indicator and valve, which is used to regulate the heat input, control the height of the vapor column, and insure maximum operating economy.

In order to maintain constant solvent levels in the various chambers, a motor-driven solvent transfer pump is used to return the overflow to the boiling chamber. This pump is also used for the transfer of solvent from any one chamber to any other chamber when cleaning the machine or distilling the solvent. It may also be used when filling the machine with solvent.

While the unit shown is arranged for steam heating of the solvent, models are available which employ gas or electric immersion heaters as the heating medium.

Water-Washed Spray Booth—A battery of spray nozzles thoroughly washes the exhaust fumes, preventing pigments or inflammable solid matter from passing through the exhaust fan into the outside air. This greatly reduces the fire hazard in industrial finishing operations, protects the plant from unsightly deposits of pigments, and prevents damage to adjacent property.

Wet exhaust air is passed through a set of eliminator plates which re-



One of the smaller models of the new water-washed spray booths.

move all free moisture, returning it to the spray chamber for recirculation. Make-up water is automatically supplied to replace evaporation losses. These units come in parts easy to assemble and can be furnished in various sizes to meet special requirements.

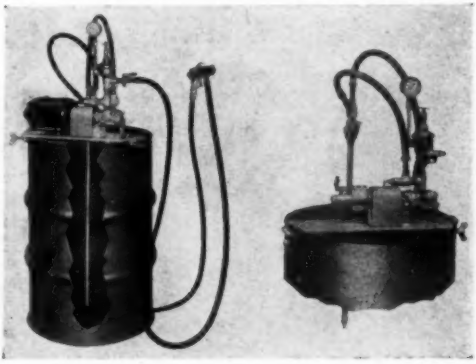
Fluid Circulating Pump—Offers an efficient, economical, safe method of delivering clear varnish, clear lacquer and other non-pigmented finishing materials from the shipping container direct to the spray gun. Eliminates the necessity of transferring the material from the shipping container, and makes possible an economical and efficient pressure-feed system direct from the drum.

The pump draws material out of the drum and generates sufficient pressure in the pump head to feed the fluid to the spray gun at the correct pressure, as predetermined. The speed of operation is limited only by the operator's ability to handle the gun. According to the company, "Reports from plants where the unit has been installed indicate time savings of 25% to 40% over gravity or pressure drum methods. A consistently higher quality of work is effected by unvarying fluid pressure at the spray gun."

One of the greatest advantages of the mechanical striper over the sword brush is that the variation in the pressure of the wheel against the surface, or the speed with which the operator draws the striper, does not vary the width or perfection of the stripe. With a sword brush the slightest variation of pressure against the surface widens the stripe at that point.

Unit and hose can be cleaned each day after use. No dirt or foreign substance can get into the finishing material, which is protected by an adjustable sliding collar on the tube entering the drum.

Pumps material from shipping drum directly to spray gun.



Photographic Silk Screen Plates—Used to reproduce pen and ink drawings containing the finest detail; also photographs or washed drawings. With these plates you can print detail and produce graduated tones that would be impossible with hand-cut stencils. They can be used for the reproduction of wood or marble graining, as well as for illustrating portraits and other illustrations.

Each screen plate prints perfectly and reproduces exactly with clean straight lines. If handled properly, from 5,000 to 10,000 impressions may be secured from each screen, and sometimes even more. Perfect register is assured on multi-colored jobs.

Customers must submit their own copy in black and white in line or wash drawing. The camera reproduces faithfully so that a good finished original is essential. For small fine detail work the drawing should be at least twice actual size, so that it may be reduced and maximum sharpness obtained. Copy must be kept in proportion. These plates are made in practically any size. In some cases there are size limitations on halftones.

Coating Machines (Models SP and SPC) — Frames of the two coating machines illustrated here are of welded steel, although they are also available in cast iron. All bearings of the SP model are 2-screw split type so that any of the rollers can be lifted out by removing only four screws. End seal plates are held in position by motion of rolls; they can be removed simply by lifting them out of place.

The applying rolls are available cushioned with rubber, synthetic rubber, gelatin, rubber with a gelatin covering, or with a metal surface—to suit the individual requirements.

The feed roll and doctor roll are made of steel tubing with heavy spider plates welded to both the shell and the shaft to form a rigid unit which, when ground smooth, will retain its accuracy over a long period of service. Cores for the cushioned applying rolls are made in the same manner as the all-steel rolls and then covered with the cushioning material.

The cushioned rolls of the SP Model are fitted with metal wear plates on their ends where they con-

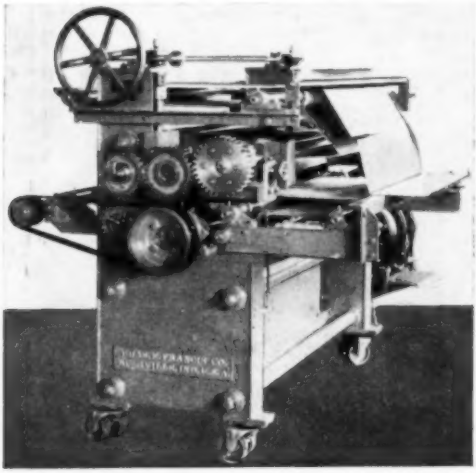


Fig. 1—This SP Model coating machine is a 48-in. single coater; weighs 3500-lbs. It is fitted with a circulating pump unit consisting of a motorized pump supply tank and connections. It also has an automatic conveyor feed attachment.

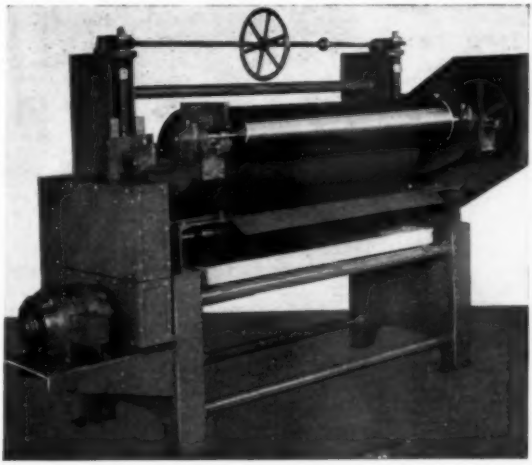


Fig. 2—Model SPC single coater machine has a 17-in. diameter rubber-covered roll, with adjustments which permit satisfactory heavy coating.

tact the seal plates. In this way the cushion material does not contact any other member in any but rolling friction position, and roll wear and power consumption are held to a minimum.

The coating material is carried in a trough formed by the crotch between the doctor roll and applying roll, which is sealed at the ends by means of removable seal plates. This is said to eliminate the need for a separate pan or trough, and it greatly simplifies cleaning.

When made for single coating the bottom roll acts as a feed roll only. This roll is then fitted with a doctor plate of spring bronze which removes any of the coating material that might be picked up from the applying roll in coating thin stock, so that no coating material will smudge on the dry side of the sheet or panel being coated. Any type of drive can be used, such as an ordinary motor, "V" belt variable-speed, and so on.

Niagara Paint Meter—Used to give accurate reliable records of the flow or consumption of any paint, varnish or lacquer product. When used on the lines from pressure tanks to spray guns it allows an accurate indication of the quantity of finishing material used during any period of time to allow calculation of the amount consumed per piece finished. This enables cost standards to be established and observed, checks waste of materials, and the total counter readings allow determination to be made of when pressure tanks need refilling.

Paint meters are available in sizes to measure the flow of finishing materials at any quantity, either for handling in bulk or for measurement during the manufacturing or blending operation.

The most common size of Niagara

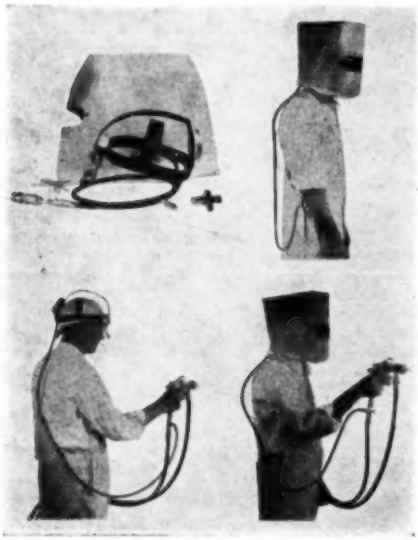
Measures quantity of finishing material that passes through line.

Paint Meter is the AVG size with ½-in. connections; 12 other sizes are made to handle any required rate of flow. The AVG size registers in pints, and larger sizes in U. S. gallons, Imperial gallons, or liters.

Hood Respirator—Covers the head and neck, providing complete protection where ventilation is inadequate, or where there are materials present in the air that might prove harmful to eyes, ears or respiratory organs. A neck-cloth at the bottom of the hood is fastened around the neck by a drawstring. The large unobstructed opening in the front of the hood—which permits maximum range of vision—serves as the only outlet for the constant outward flow of air supplied to the hood by the air hose.

An air line pressure of 10 to 40-lbs. is necessary to supply the hood with sufficient air to provide breathing facilities and to maintain the outward flow of air through the vision opening. The air hose attached to the filter is 3½-ft. long, and has a quick detachable connection for attaching to air line. By detaching the hose, the operator can leave the working area without removing his hood. The air hose is also equipped with a clamp which, when attached to the operator's clothing, carries the weight of the hose. The economical paper hood is removed when it becomes soiled, and is easily replaced by a new one. Two snaps fasten the hood to the headgear.

Flock Spray Booth—A direct exhaust type of spray booth designed especially for the application of flock. Permits the concentration of spraying operations in one location, prevents this light material from scattering throughout the finishing room and reclaims sprayed flock not applied to the articles coated. Available in widths of 3 to 10-ft. with direct-type exhaust fans. Removable, reinforced, cheesecloth screens at rear of booths collect the flock and prevent it from entering the exhaust pipe. Each booth has a metal curtain at the top and sides, and is provided with the required number of sprinkler openings. An opening in the floor, directly in front of screen and extending the entire width of the booth, allows for the collection of overspray in the recessed chamber beneath. A hinged door at each end provides access to inside of collection chamber and allows for easy removal of accumulated material. Booths of 3 to 6-ft. widths are of the leg type, while those ranging from 8 to 10-ft. wide are of the floor type. They are strongly welded unit construction, similar to standard paint spray booths.



Outward flow of air from opening in hood assures clear vision for operator.

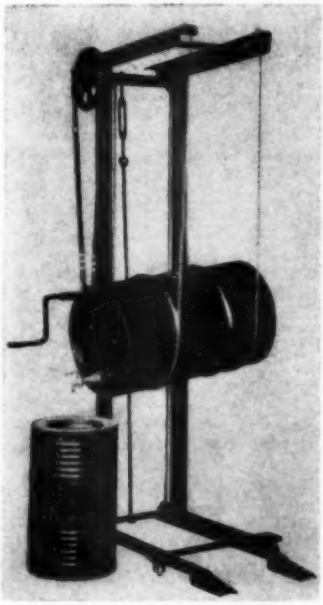
Roller Coating Machine — Applies coating materials to sheet stock and flat work by spreading it on with rollers as the stock passes through the machine at rates of speed up to 75-ft. per minute. The machine deposits a coating of uniform thickness with no wastage of finishing material except the small quantity left on the rollers when a job is completed, or at the end of a day's work when the rollers must be cleaned. The machine can be fed by hand or conveyor. It will coat stock ranging from very thin rigid or semi-rigid materials up to 1-in. in thickness and as wide as 44-in.

These exposed gears are really covered with a sheet-metal guard.

Drum Elevator—Designed to raise a varnish drum high enough for draining the contents. Its use is indicated where drums need to be completely drained or where it is necessary to transfer the contents to other drums, smaller containers or mixing tanks. Another application is with can filling machinery, as well as bottle and syphon fillers. It is also useful with straining and filtering operations.

In use, it is only necessary to roll the full drum onto the skids, place a loop of sprocket chain under each end and raise. The crank can be transferred to either side, for right or left-hand operation. If the drum is to be tipped for draining, one loop of the chain is made longer by drawing it over the sprocket.

A 50-gallon drum can be raised 6-ft. with standard elevator. The vertical members can be furnished longer should greater elevations be required.



Handles filled drums safely.

The modern spray equipment manufacturing firm not only supplies the equipment to do the work, but it also supplies the engineering supervising ability to help the users develop the efficiency which they are seeking in the operation of their factories.

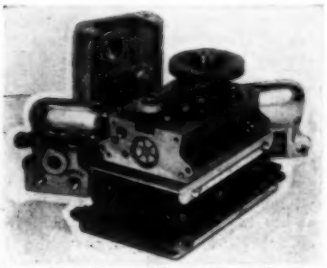
Speed-Bloc Sander—A new model has been designed and developed to meet the requirements of reconditioning used cars and bodies. This machine eliminates the tiresome and costly drudgery of hand sanding,

Fits into your hand readily.

rubbing, scuffing, featheredging and removal of signs from commercial bodies—with savings of from 25 to 75% in labor and abrasive costs, and substantially increased production.

The principle of "floating" as applied to the construction of the block and pad (see illustration) is an exclusive feature. This design provides flexibility for sanding and rubbing the many curved surfaces encountered in automobile refinishing work and permits operation in corners and close to body moldings.

The machine's reciprocating action duplicates hand movement, eliminates the danger of cutting through



A peek at the precision made mechanism inside the machine.

and assures high quality block sanding and rubbing 25 to 75% faster than is possible by hand. The machine develops approximately 3,000 complete oscillations per minute, with 5/32-in. travel of the sanding pad.

For wet sanding, a water connection is provided for attaching water hose, with outlets on each side of the sander directing a spray of water to the surface being sanded without discomfort to the workman.

In the new model, the air motor block is manufactured of cast aluminum. Weight reduction and perfected balance make the machine extremely responsive to the guidance of the operator. From one to five sheets of abrasives may be attached to the pad at one loading. For compound rubbing, a polishing cloth is attached to sanding pad in place of abrasive paper.

Touch-up Unit—A compact touch-up unit for touching up or patching damaged places in the finish of furniture, automotive equipment or any other products that have finished surfaces. Perfect blends of colors—smooth, even and uniform—are easily obtained, assuring a smart lustrous finish of the highest quality.

For touch-up work and fine decorating.

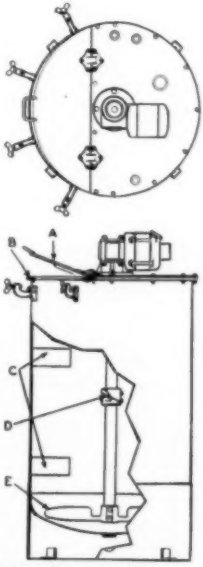
All coating materials such as enamels, paint, lacquers, synthetics, etc., may be applied light or heavy as desired. The unit is especially suitable for delicate spotting, shading or stenciling.

The airbrush has a graduated round and fan spray multiplehead, providing the smallest round spray up to the widest fan spray, simply by turning the head as desired. In addition to air-painting and retouching, this unit may also be used for

fine decorating and finishing of many small articles. Interior decorators also use this unit for decorating walls and ceilings in the latest modernistic effects.

The airbrush is light, easy to operate and requires only 2 to 3-cu.ft. of free air per minute at pressures of 25-lbs. and upward. A ¼-hp. portable air-compressor unit will provide sufficient air to operate this unit at maximum efficiency.

Hinged-Lid Mixing Tank — This tank allows for the mixing of lacquer, synthetic enamel and other pigmented finishing materials in an inert atmosphere, thereby preventing oxidation while handling.



E—Main agitator paddle.
A—Hinged lid allows easy filling and inspection of tank.
B—Full-gasketed lid . . . . sealed by solvent-resisting composition.
C—Baffles properly placed in tank prevent swirl; aid agitation.
D—Auxiliary agitator paddle insures uniform agitation full height of tank.

The tank has a plain, straight sided shell inserted into a foot ring. The cover is made of 5/16-in. flat steel stock, hinged across the tank, the hinged portion being made pressure tight by the use of clamps; the remainder of the cover is bolted through a special composition gasket into a steel channel which is welded to the tank lip to provide a gasket recess. Agitation in this tank is adequate to efficiently mix the heavy-bodied pigment portions throughout the entire batch and to maintain a properly mixed material.

A one-piece impervious special composition gasket seals the tank vapor tight, therefore, preventing explosive vapors from leaking out into the mixing room. With lid in clamped position, assurance is afforded against overruning in case of emergency—thus preventing loss and safeguarding against other hazards. Each tank is equipped with an explosion-proof motor.

The tanks have been so designed that they may be inter-connected in many ways to form a battery.

Air Motored Agitator for Drums—An air-motor drive for agitators built integral in paint drums. The unit consists of a standard air motor and a reduction unit.

An efficient and safe method of agitating paint in shipping containers prior to delivery to the material feed system in the finishing department. Included are two drivers, one for ½-in. square and one for ⅝-in. square on the agitator shaft. These drivers are threaded to fit the thread on the drive shaft. An adapter with

Takes power from compressed air line and drives the paint agitator drums.

1½-in. and 2½-in. straight male thread, and 1¼-in. female pipe thread to fit the openings in the paint drums is also included.

The unit is extremely portable, and may be transferred from one drum to another in a few moments time; will operate from a 1-hp. or larger air compressor, dependent upon the speed of agitation required. Speed of the motor is adjustable from 10-r.p.m. up.

Paint-Circulating Systems — Delivery of clean, fresh, uniformly mixed materials through pipe lines to the spray guns makes for better working conditions. It eliminates the trucking of paint through the plant, prevents any mess around spray booths, makes possible a greater degree of plant cleanliness and reduces fire hazard. There are no containers to clutter up the booths or to be cleaned and refilled.

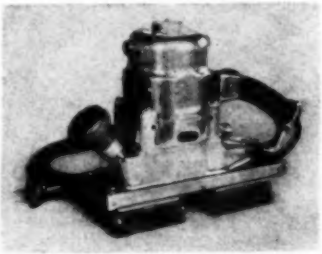
Each pipe line carries a different color or kind of material. The finishing material for the paint supply lines is put into mixing tanks and thoroughly mixed by a motor-driven agitator. It then is drawn from the tanks through the pumps, is strained and is circulated constantly from the mixing room direct to spray operators and is returned to the mixing room. Regulated paint outlets are provided at the various spraying locations.

The circulating system is a positive guard against the fluid flow being tampered with by spray operators. Fluid control can be placed in designated hands. Any tendency of operators to interfere with the paint mixture by adding thinner to suit their convenience is eliminated. "Off color" and dirt troubles are also done away with.

Finishing material is delivered to spray guns at a uniform pressure and is applied in the proper thickness, thus lessening sanding and polishing. Paint circulating systems are available in small as well as in large installations. They offer the modern method of paint handling for any plant where there is a continuous volume of production finishing.

Part of a modern paint-circulating system in automobile plant.

Dual-Blok Sander-Rubber-Polisher —A portable electric machine that does a variety of hand work more uniformly, more rapidly and more easily. Its extension cord plugs into any electric light socket, A.C. or D.C., 110 to 115 volts. The machine has two reciprocating pads over which abrasive paper or cloth can be stretched and secured, thereby making the machine ideal for rapidly smoothing bare wood or metal or



Plugs into and operates from any 110-volt electric light socket.

sanding lightly between coats or removing old finishing coats or feather edging for repair finish.

When machine is fitted with treated felt pads it is ideal for rubbing the final coats on furniture and pianos—rubbing with water or oil as is ordinarily done by hand.

The use of the mechanical striper has entered into many fields that were never thought of two years ago. For example, we have manufacturers of fabricated materials running a continuous stripe near the edge of large sheets of building paper, canvas, imitation leather, etc. This is used solely for trade mark. Other concerns are using the mechanical striper for striping on tubing, conduit, etc. The striping of sporting goods, such as tennis racquets and croquet sets, is being widely used. Other manufacturers are running a series of stripes while their product is in the process of manufacture; sometimes six or eight stripes at one time as the tools, in this case, are held in place by a rigid arm, each with a slight spring tension to compensate for irregularity in the surface being striped.

With polishing cloths or sheep's wool stretched over the pads the machine becomes a splendid polisher for use on plated and finished metal surfaces, and for finished wood or composition surfaces.

The machine has a rhythmic-moving internal mechanism which propels the pads back and forth without the customary vibration, causing them to simulate greatly speeded-up hand motion. The machine operates so smoothly that the operator can take both hands from it while it is going full speed on a level flat surface. Size of machine, 3½-in. wide, 8-in. high and 11-in. long. Weight about 10-lbs.

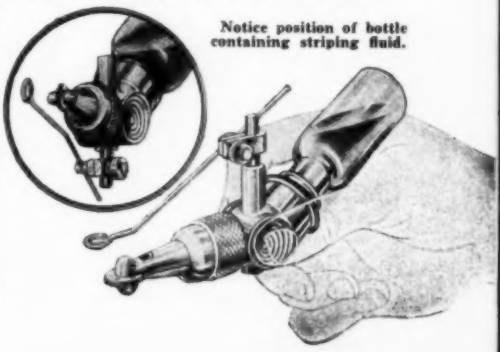
Master Paint Striper—Models are available for making straight and curved stripes 1/64 to 3/16-in. wide. Stripes are laid on with a little serrated wheel which is fed from a small reservoir and which is rolled over the surface to be striped. The model illustrated here has a removable gravity-feed glass supply bottle which holds enough material for making 2000-ft. of 1/64 in. striping.

By using glass supply bottles, paint can be stored for a long time between uses. This method saves time and waste because the material container does not have to be cleaned after each job. Standard screw-top bottles fit the striper and many sizes are available at any drug store at a small cost.

The tool operates in any sideward position, horizontally or vertically or downward. For striping work that is overhead the gravity-feed supply bottle must be replaced with a standard force-feed material container with a plunger.

The tool can be used free hand or with a straight or curved template or with the adjustable guides bent to any suitable shape to parallel the stripe with moldings, beads, edges, etc. Special guides or templates can be made up for production work. The tool is designed to feed the paint at from 12 to 15-ft. of stripe per minute.

Larger width stripes are made by making two outside lines and filling in between with a brush. Double or multiple stripes are made by adjusting the guides or straight edge.

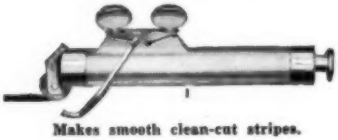


Notice position of bottle containing striping fluid.

Beugler Striper—Has several exclusive improvements to more effectively solve the striping problem. Striping on the curved surfaces of molding is now facilitated by an adjustable "swivel-acting" wheel head.

Another feature is that both the striping wheel and axle are made of hardened steel, insuring long wearing surfaces and truer action.

Elimination of dripping is accomplished with an improved design whereby the natural movement of



Makes smooth clean-cut stripes.

the striping wheel causes all surplus material to be automatically drawn back into the barrel and remixed, even when the striper is used in difficult positions.

An additional feature is that the wheel head is provided with an extension for striping with straightedge or templet, if desired, instead of with the adjustable guides.

Striping material is held in contact with the wheel by a movable plunger, thus permitting striping in all positions.

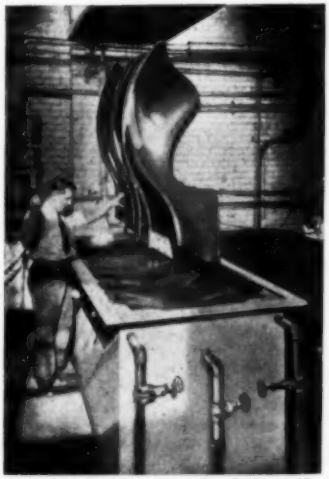
This tool is designed for easy cleaning; requires only one minute for a complete change of color. It is made to operate with any standard striping material.

Wheels are furnished for making all width stripes from 1/64 to ⅛-in. An assortment of adjustable guides makes possible perfect striping for practically any type of work.

Dip-Spra Bonderizing—A new method of application, whereby the effectiveness of a Spra-Bonderizing (a process that produces a corrosion-inhibiting coating on galvanized zinc alloy and cadmium surfaces, as well as on iron and steel) is adapted to the needs of the producer whose requirements do not justify the installation of conveyor equipment. In other words, it combines the coating efficiency of Spra-Bonderizing with the lower equipment costs and convenience of an immersion process, as well as widening the utility of Bonderizing to include certain non-ferrous metals.

This new process will be of interest to many manufacturers whose products must be painted, especially those who have had some difficulty in getting effective adherence of paint to galvanized or other zinc-coated surfaces. It is claimed that the coating produced by this process will increase the paint holding efficiency from five to seven times, which has been amply demonstrated by many accelerated tests in laboratories.

The equipment requirements are comparatively simple and easy to install, consisting only of a steam-heated processing tank of suitable size, in which a spray pipe is placed above the solution level. This spray pipe is plain stainless steel, drilled with a series of ⅛-in. holes from 2



A typical Dipping Spra Bonderite tank.

to 4-in. apart, through which the solution is circulated by a small pump at one end of the tank. Large or deep tanks are fitted with a spray pipe on each side.

Crown No. 20 Spray Gun—The body of this gun is made of unbreakable drop-forged aluminum. The spray head parts are self-aligning, mounted on fluid nozzle, and are interchangeable; air nozzle is brass; fluid nozzle, steel; fluid needle assembly is made of hardened steel and is removable as one piece. The gun has air pressure control in combination with spray width control. The adjustment from round to all widths of fan spray is located above material control at back of gun.

Easy to hold and adjust.

When spraying from pressure-feed containers, a curved fluid tube adapter (not shown in illustration) brings the material hose connection close to the air hose connection at lower end of handle, so the two hose are close together and therefore more easily and conveniently handled by the operator. The quart size cup shown attached to this spray gun is spun aluminum with a reinforced collar. It is leak-proof, can be instantly detached or replaced by half a turn movement, and is easily cleaned.

Power Turntable—A motor-driven turntable (air motor or electric motor) for supporting and turning articles being sprayed in the spray booth.

The article being finished, when placed on the turntable, can be revolved in front of the operator without loss of time or effort by simply pressing the pedal controlling the motor.

By means of an air regulator on the air-operated model, the revolving turntable can be set at any desired

Turns the work by power.

The portable fluid pump is something new that one of our customers swears by. It may be used with a removable head drum and compressed air used to keep the contents properly agitated while the material is being forced up to the nozzle of the spray gun in such way that a full wet coat is applied. This kind of equipment is particularly valuable to any one using clear lacquers on furniture, radio cabinets, caskets, etc. The old way of compressing air in the drum, ruined many a good drum and caused an alteration between the user and the lacquer manufacturer. If a trifle too much air was used, the drum heads were sprung, making the drum unfit for further use.

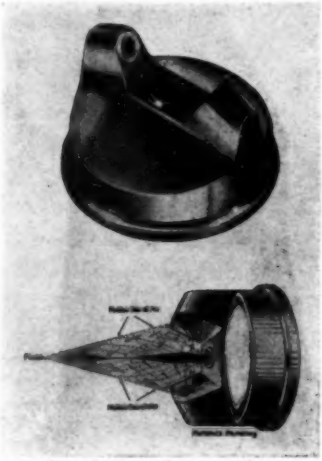
speed. On the electric model the speed is regulated by a variable-speed pulley. The motor is totally enclosed to protect it from paint and dirt.

The handy pedal, giving instant stop and go operation, leaves both of the operator's hands free to handle the spray gun and the object being sprayed without wasting time.

Revolving turntable discs are available in round or square shapes from 8 to 24-in. in diameter. The standard height of the turntable is 30-in., but it may be made higher or lower as specified.

"Hollow-Air" Atomizer Head — An atomizer head or air cap for Type MM and multi-width spray guns, made to discharge jets of "hollow-air." The invention of these "hollow-air" impinging jets instead of solid jets of air heretofore used in spray guns is entirely revolutionary.

According to the manufacturer, the jets of "hollow-air" smoothly atomize synthetic enamels, paints, lacquers, etc., with finer and wider sprays than have ever before been known. Spray widths, with the usual air pressure and using either siphon or force feed, have attained almost phenomenal fineness and width, atomizing to the outermost edges of the spray.



How the new air cap works.

Nineteen hundred and thirty-seven and the few years preceding it have been history making years in the spray finishing field. The spray gun itself and all the accessories to a perfect spray finish have been greatly improved. Greater speed, better atomization, and the cutting down of air consumption have been some of the outstanding specific advancements.

One of the large paint-testing and developing laboratories says: "The operation of the gun, with "hollow-air" atomizer head, enables the operator to apply synthetic paints with a fan spray of uniform width, without splitting, giving good atomization between extremely wide limits. Working with the gun at the normal distance of 6 to 10-in. from the work, perfectly satisfactory spray widths of 18-in. or more are obtained."

Adapter for Paint Cans—A standard paint-can adapter that makes it possible to use the original paint can as a spray-gun cup. The operator can change from color to color quickly and save the trouble of washing the cup each time. The use of this adapter makes it possible to have a separate plainly-marked can for all colors, primers, surfacers, etc.

The new adapter fits most standard paint cans. It is simply placed on the top of the can, the handy lever clamps on the inside of the adapter are tightened and the new "cup" is ready to fit into the yoke of the standard spray gun attachments. The adapter can be readily removed from can.

Referring to the accompanying illustration, "1" indicates tightening clamps; both clamps should be en-

How it's attached to ordinary paint can.

gaged partially and then tightened. No. 2 shows the Thiokol gasket for seal-tight fit. No. 3 shows one of the ears on adapter to fit into openings on yoke of standard spray-gun attachments.

Portable Disc Sander—This portable sander has a heavy duty ball-bearing motor that operates the sanding disc at 4500-r.p.m. It is fast and powerful, comfortable in the hands, and is easy to operate and control. It is the ideal disc sander for constant production work.

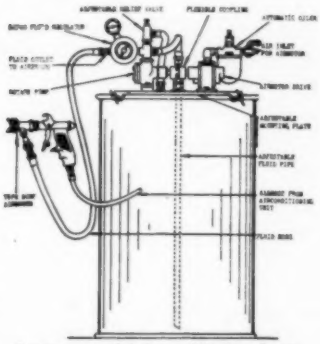
Handy for smoothing certain metal surfaces before finishing.

Standard equipment includes 20-ft. of 3-conductor cord and rubber plug, a heavy duty switch, a 7-in. pad, and one abrasive for metal sanding.

This unit is recommended for grinding and smoothing down welds, steel and iron castings, auto body and fender work, and removing rust and scale. If desired, a cup shaped grinding wheel or wire brush can be substituted for the pad and abrasive disc.

Portable Fluid Pump—Here is a portable fluid pump that can be mounted on the head of a material container and set into operation to draw material from the container and supply it to a spray gun.

It consists of a motor, either air



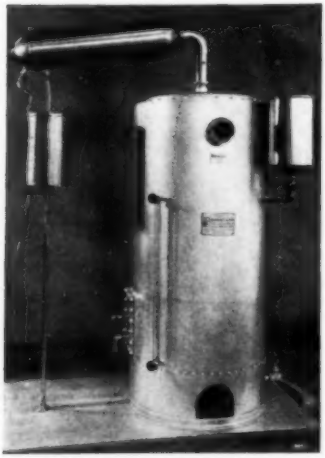
Draws material from shipping drum.

or electric driven, fluid pump with collapsible fluid pipe, adjustable relief valve, regulator and gauge, and adjustable mounting plate; is easily interchangeable and quickly transferable from one material container to another. Pressure, which is con-

Our company has developed special enamels for use in the "Filwhirl" centrifugal machine; this is a particularly effective way to finish small metal pieces.

trolled by the fluid regulator, is built up by the pump to the airbrush and not in the container. From 1 to 60-lbs. pressure can be maintained continuously by this method.

Cleans Used Solvents — Used solvents that have become dirty and mixed with other materials in the process of cleaning or degreasing metals, etc., can be restored to their original purity and usefulness by



Reclaims and cleans solvents.

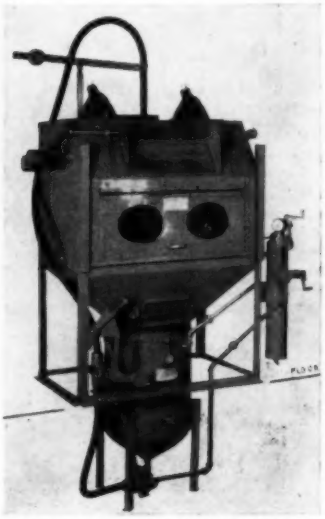
putting them through a recovery still. The cost of salvaging many used solvents is only one or two cents a gallon, according to the manufacturer of the recovery still illustrated here.

Such solvents and cleaning fluids as carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentrchlorethylene, acetone, toluol, benzol and naphthas are being regularly recovered by this process.

The stills are available for either continuous or batch operation. They may be heated by gas, steam or electricity.

Further developments in oven design have been toward increasing the safety of operation. This has led to more elaborate auxiliary equipment to be used on the burners, as well as a change in oven housing equipment to take care of explosion requirements. Such requirements are becoming more drastic as time goes on, especially in the use of finishes that employ highly explosive volatile solvents.

Sandblast Cabinet—Useful in the metal trades for dry-cleaning castings before the application of finish coatings or plating. The particular model illustrated here is a 48x30-in. sandblast cabinet fitted with a direct pressure 400-lb. capacity sandblast generator which takes the place of the usual suction gun.



A new model outfit for blast-cleaning castings

External Atomizing Spray Gun—A new type of commercial spray gun which is said to effect a considerable saving in air in the application of lacquers, enamels and other fast-drying materials.

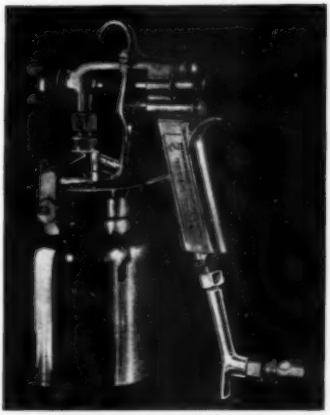
Paint materials leave the nozzle orifice enveloped in a tube of air, as in the ordinary spray gun. Then, instead of being played upon by a number of air streams from several

Spray gun with cup attached.

side ports, it receives two blasts that are softened as they slide off baffle planes spreading the pattern. Only these two auxiliary air streams are required to complete atomization and produce the ideal oblong pattern. On this account the manufacturer claims a better coverage in shorter time and at a considerable saving in compressed air used for operation.

The spray gun is of the shut-off type for use with air storage tank. Five sizes of nozzles are available.

Air Connection Support — For syphon-cup spray guns which eliminates the danger of tipping when the cup is placed on flat surfaces. Formerly, when the gun was not in use, it was only possible to hang it on a rack by means of the top hook shown. The new support simply fastens on to the present air inlet and thereby offers a new inlet which permits the air hose to be attached in a horizontal position. A portion of the attachment extends far enough to perfectly balance with the bottom of the cup, thus affording the necessary support.



Handy for syphon-cup spray guns.

After many years of experimenting in the application of finishing materials, this company has perfected the "Hollow Air" Atomizer Head. This device produces, from the side wings, hollow impinging jets of air which meet the central fluid jet and deliver a smooth finely atomized spray to the work. It is particularly valuable in the application of synthetic enamels which are unusually hard to apply and require considerably more supporting air than other lighter lacquers and similar finishes.—Spray Equipment Mfr.

Is Your Compressed Air 100% Ok for Spraying?

by W. B. Crawford
Binks Manufacturing Company

Does your spray man have clean compressed air in sufficient volume, backed by adequate pressure?

Do you know how to check the rated capacities of compressors against the requirements at spray guns—and make allowances for line losses, continuous service, intermittent service, etc.?

What about air tanks, pulsation chambers, automatic cut-outs, oil-and-water extractors, air hose, pipe lines, pressure regulators, material containers, spray guns?

These and other practical points are taken up in this article.

GIVEN THE PROPER spray gun and a good finishing material correctly reduced and strained into a clean cup or pressure tank, the spray operator is still dependent on an adequate source of compressed air.

While the pressure of the air is important, it is secondary to the volume of air as expressed in cubic feet per minute (c. f. m.). The user of spray equipment is prone to think of compressed air only in terms of pressure and if inquiry is made of the available air supply, he is apt to state that he has a tank (so large) in which he can build up 100-lbs. of air pressure. He overlooks the fact that if the compressor is too small to deliver the volume required, he will be taking the air out of the tank faster than the compressor can replace it.

Many spray operators readily understand that in dealing with water, a pump of a certain size will deliver so many gallons of water per minute and the size of pipe through which the water is pumped will govern the amount of pressure that has to be exerted to overcome the resistance to the passage of the water. Use of the water analogy is helpful in getting a user to realize that volume, as applied to air as expressed in c.f.m., is the same as water volume expressed in g.p.m. The larger the orifices in a nozzle the greater will be the volume of air in c.f.m. forced through under a given pressure.

Compressor Ratings; Air Receiver Tanks

Compressor manufacturers rate compressors in displacement of c.f.m. rather than in actual delivery of air in c.f.m. In other words, a certain bore and stroke of compressor driven at a given speed will displace so much air; but the displacement and the actual delivery of a compressor can never be equal, as that would represent 100% efficiency, which of course can never be achieved. Small compressors have an actual delivery that is approximately 65% or 70% of their displacement; hence, a compressor rated at 10-c.f.m. displacement will deliver not over 7-c.f.m.

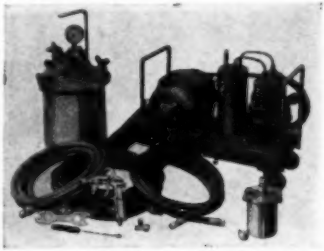


Fig. 1—In the typical small portable compressor set, there is only a small air-receiving or pulsation chamber.

Fig. 2—In heavy-duty outfits the air storage tank is large enough to carry a reserve supply of compressed air.

The air requirements of spray guns are indicated in actual delivery of air. When a spray gun is supplied compressed air by a portable compressor that has only a small air-receiving chamber or pulsation chamber (as shown in Fig. 1) instead of a regular storage tank, then care must be taken to choose a compressor that delivers the full volume of air called for by the gun.

On the other hand, large heavy-duty portable compressors and stationary compressors are built with air storage tanks or air reservoirs of ample size (see Fig. 2) and when one of these is used, the compressor can have an output of less than the gun requires—provided the gun is not used constantly. For example, a compressor that actually delivers 5-c.f.m. and which has an air storage tank, will satisfactorily operate a spray gun that requires 7 or 8-c.f.m.—when the gun is being used where the service is necessarily intermittent with the gun is shut off at the end of each stroke and where the spray operation is completed in 15 or 20 minutes. The compressor running continuously will replenish the air in the tank at those intervals when the gun is closed. Where spraying is continuous the compressor should have delivery equivalent to the requirements of the spray gun.

Automatic Unloaders; Cut-outs

A stationary compressor may be fitted with either a suction valve unloader or an automatic electric cut-out. When the pressure in the storage tank reaches a predetermined amount, a suction

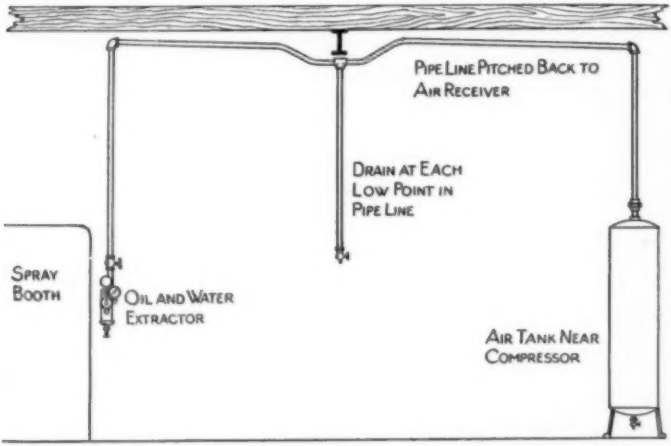

PIPE LINE PITCHED BACK TO AIR RECEIVER
DRAIN AT EACH LOW POINT IN PIPE LINE
SPRAY BOOTH
OIL AND WATER EXTRACTOR
AIR TANK NEAR COMPRESSOR

Fig. 3—Illustrating some points to observe in connection with the installation of compressed air pipe lines. For example, avoid "dips" or low places in the horizontal pipe lines when possible, but if one or more low places are unavoidable, be sure to provide a means of draining condensed moisture from the lowest points of each "dip."

valve unloader will cause the suction or intake valve, or valves, to be held open. This removes the load from the driving motor by preventing the compressor from pumping air, with the result that the motor, although it continues to run, simply idles with practically no load. When the pressure in the tank falls approximately 15-lbs. the action of the unloader is overcome and the compressor resumes pumping.

An automatic electric cut-out, by means of a pressure switch, disconnects the electric motor from the power line when a certain pressure has been built up in the air storage tank; and starts the motor again when the pressure falls to a certain value.

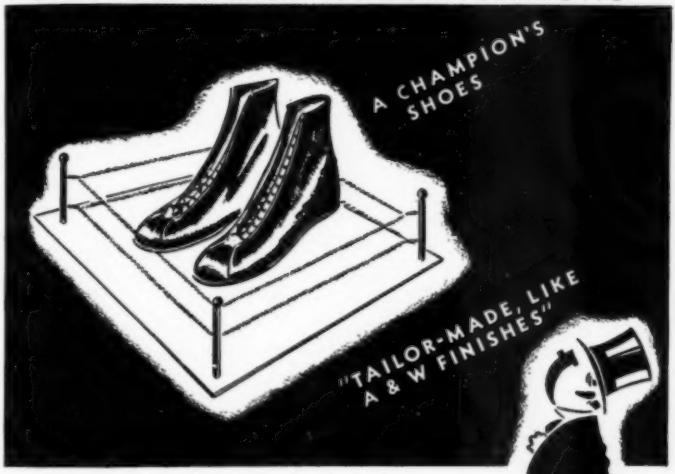
When anywhere near the full capacity of a compressor is required almost constantly, a suction valve unloader is the more desirable arrangement. However, in those cases where compressed air is needed only at infrequent intervals, or possibly only a small part of the day, then an automatic electric cut-out is advocated.

Moisture; Oil; Dirt . . . . All Harmful in Compressed Air

The finest air compressors money can buy will pick up the moisture in the surrounding atmosphere and pass it into the compressed air line where it condenses into water and spoils otherwise perfect finishing jobs unless removed. In humid, damp climates and on those muggy days that occur in almost any climate, the condition just mentioned is greatly aggravated.

Another undesirable element in compressed air is oil. However, its presence is not as prevalent as water because an air compressor,

BUILT TO EXACT SPECIFICATIONS



Naturally, the champions of the ring do not choose their fighting shoes at random . . . out of stock. Too much depends on fast footwork to risk improper fit. Their shoes are custom-built . . . "tailor-made" to fit exactly.

A & W builds Industrial Finishes with the same exacting care. Each finish is designed to do an individual job . . . and do it best. And the result to the manufacturer is more salable, more attractive merchandise, and lower production costs. A & W "Tailor-Made" finishes uniformly give greater coverage, speed up production, eliminate excessive rejects, reduce labor costs.

Call in the A & W representative. From his study of your product and manufacturing processes, the A & W laboratories will be enabled to produce a finish built to your exact needs . . . "Tailor-Made" for the job.

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when new and in perfect condition, should not pump oil into the compressed air line.

What takes place in the cylinder of a piston-type compressor is quite similar to what occurs inside the cylinder of an automobile engine—and the same things that make an automobile engine pump oil will cause a compressor to pump oil as wear occurs. To correct oil pumping, new rings usually suffice, but in aggravated cases over-sized pistons may be necessary. When a particularly bad oil pumping condition has been permitted to exist for some time, it may be found that the air line pipe is saturated with oil, so after the compressor has been reconditioned the pipe should be flushed out by forcing the naphtha or benzine through it under pressure. Otherwise, the oil collected on the inside of this pipe will continue to show up on the surface being finished.

The third objectionable matter in compressed air is dirt or solid particles, the majority of which can be avoided by the use of a correct air intake filter on the compressor. Failure to clean the air intake filter frequently enough, or other poor housekeeping on the part of the operator, will allow dirt in varying quantities to get into the air line, from which it must be removed before reaching the gun.

To Clean Compressed Air

Water, oil and foreign particles can be satisfactorily removed from the compressed air line with the proper oil-and-water extractor when used the correct way. The oil-and-water extractor should be as near the spray gun as possible and as far removed from the compressor as conditions will permit —and under no circumstances should it be closer to the compressor than 25-ft., see Fig. 3. This permits the air to cool sufficiently between the compressor and the extractor to get the full benefit of condensation. Because of the condensation that takes place in the air pipe, it is advisable to slant the pipe back toward the air storage tank so that this condensation can drain back into the tank from which it should be removed at frequent intervals by opening the drain cock.

Fig. 4—An oil-and-water extractor with typical pressure gauges attached.

At every low point in the air line, as for example where a dip is made under a joist or beam, a drain cock should be installed to dispose of condensation that collects.

Realizing the importance of taking full advantage of condensation, some industrial firms chill their compressed air by passing

WHEN IT RAINED

Remember those black cotton umbrellas the ladies used to carry? They had long, thin handles and a sharp point at the tip that could be a formidable weapon in the hands of an angry woman. The metal parts of these umbrellas were finished in Black. Hilo Black Baking Japan was a popular choice for this purpose, because it gave a glossy, jet black finish that did not fade, chip or crack, even after constant exposure to the weather.

Umbrella styles have changed. The ladies now shelter themselves under gaily colored umbrellas that are short and stubby. But there's as much need as ever for finishes that hang on through hard wear and constant exposure. Hilo Black Baking Japans are best sellers today, as they were 25 years ago, because they fill that need.

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Steel.....,
Cast Iron.....,
Brass.....,
Aluminum.....

the air over a coil of cold water pipe before it enters the oil-and-water extractor. Spray equipment manufacturers can supply devices for this purpose.

This brings us to the oil-and-water extractor (or separator or filter) which, in addition to cleansing the air, provides a means of adjusting it to the correct pressure. It is mounted in a vertical position (see Fig. 4). Air enters at the top near the side and travels down just inside the outer shell, and in doing so it passes through a maze of copper shavings which tend to further cool the air and to remove solid matter from it. The air continues to travel downward to a point about two-thirds of the way down, as indicated by the indented ring on the outside of the extractor, at which point it does a complete "about face," or in other words makes a 180° turn and from then on it travels upward through the center core. In making this turn, the solid matter and drops of moisture are deposited by gravity within the settling chamber. In traveling upward the air comes in contact with baffle plates which are of a lower temperature; this causes further condensation, and beyond that it has to go through five felt filter pads. After doing so, the air leaves the unit at the top in the center and is probably as free from foreign matter as it is possible to make it under factory conditions. Care should be taken to open the drain on the oil-and-water extractor as often as several times a day.

Every month or so it is advisable to remove the nut at bottom of the extractor, which permits the entire core to drop out, and wash the filter pads in gasoline

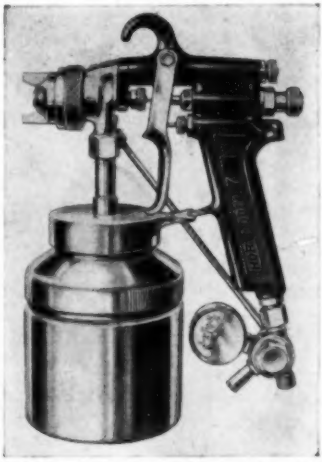


Fig. 5—A pressure-cup assembly with regulator and pressure gauge attached.

or naphtha. Once in a great while these pads should be renewed.

Air Hose; Pressure Regulator

It is my recommendation that the hose from the extractor to the

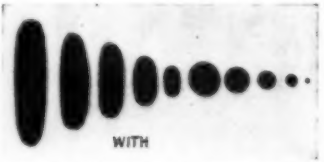


Fig. 6—Typical one-shot spray patterns from a spray gun . . . in good condition.

gun should be 5/16-in. 5-ply heavy-duty hand-wrapped, for in addition to being more serviceable than the ¼-in. light-duty hose, there is only about 5-lbs. pressure drop through a 25-ft. length of it as against 16-lbs. of pressure drop through the same length of ¼-in. hose. This drop in air pressure

through the ¼-in. hose will show a greater increase than the 5/16-in. hose when the hose becomes kinked or stepped on, or when wear takes place.

The air pressure regulator on the extractor is so designed that it will compensate for any surges that may occur on the compressed air line, and the pressure delivered beyond it will always be constant. In setting the air pressure regulator, it should be remembered that the atomizing air pressures advocated are the pressures at the gun, with the gun open, and the regulator should be set high enough to compensate for the air pressure drop through the hose and through the gun.

Material Containers; Spraying

When a relatively small amount of some specific kind of material is sprayed, as where colors are frequently changed, it is customary to use a one-quart syphon cup attached to the gun. Materials of great viscosity can not be satisfactorily syphoned and small quantities of such fluids should be sprayed from a pressure cup fitted with a regulator, gauge and safety pop valve. A cup gun of this type is shown in Fig. 5.

Where the amount of finishing materials warrant using larger containers, gravity buckets or pressure tanks are available. Pressure material tanks are unquestionably far superior to gravity containers from the standpoint of reducing fire hazard, preventing dirt troubles, and providing accurate control of material delivered to the gun.

Spray patterns produced by a modern spray gun are shown in Fig. 6. Note how uniformly the material has been deposited over the patterns and how completely it was atomized. All widths, from the widest fan spray to the smallest round spray, were readily accomplished by turning one or both of the two simple adjustments on the spray gun.

Rudd Lacquer & Sealer Appoints New Salesmen

The Rudd Lacquer & Sealer Corp. of New York, N. Y., announces the appointment of Mr. John J. Duin and Mr. M. H. Abbey. Mr. Duin is well known to the trade in Michigan, which will be his territory.

Mr. Abbey will cover southern New Jersey, southern New York and eastern Pennsylvania. Both men have had years of experience in serving the furniture industry.

Lower Cost Upkeep Painting

Information and illustrations of interest and value appear in a new 4-page 2-color folder about the "Lower Cost of Maintenance Painting," just released by the DeVilbiss Co., Toledo, Ohio. Complete portable spray outfits of great variety, for all kinds of wall, ceiling and product painting are shown, with specifications, engineering data and prices.

Spray-Painting School

The DeVilbiss Co., Toledo, Ohio, announces the schedule of their training school for the first half of 1938. This school is open to industrial painters, master painters, automobile refinishers, and all others interested in learning the technique of spray-painting, and the use and care of spray-painting equipment.

The training period lasts for one week. Classes will start on the following dates: March 7, April 4, May 9 and June 6.

Special rates in Toledo hotels and boarding houses near the plant have been secured by the company for men attending the school.

These classes have been well attended in the past because of the facilities for study, otherwise unobtainable, offered by the DeVilbiss Laboratories.

It is advisable to enroll in the school as far in advance as possible, since the size of the classes must be limited, and since there will be no training periods other than those announced.

THE FINISHING OF *High Grade Furniture—II*

In this Part II of a practical and informative article about operations and materials used in finishing fine furniture and radio cabinets, the author takes up fillers—their application, wiping, drying and some troubles that are due to filling. He also discusses sealers and lacquers.

BY R. JAY BURNS

ALL WOOD having open pores, such as walnut, oak, mahogany, etc., must have the pores filled before lacquer or varnish is applied. Otherwise the pores "drink down" the lacquer that should remain on the surface. They are also made more conspicuous and spoil the appearance of the work. This filling is accomplished with paste wood filler.

Most fillers are made of silex, linseed oil, driers and pigment, such as sienna, umber, etc., to give them the same color as the stain. Silex is an inert material made up of rough particles that stick into the pores of the wood. It does not absorb moisture nor shrink, therefore it is an ideal filler.

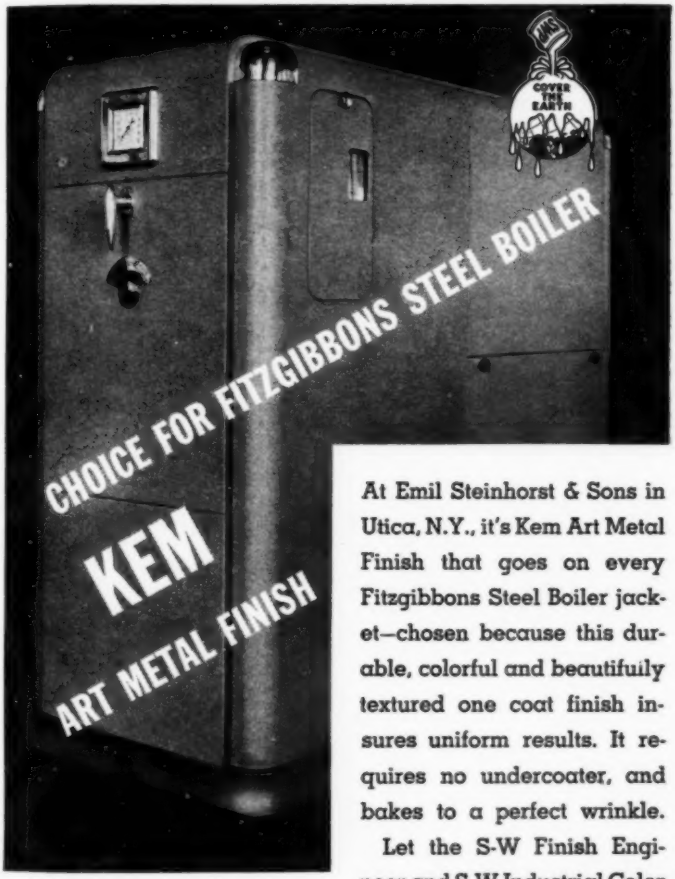
The older types of paste wood filler require 24 to 48 hours to become bone dry. Naturally, this does not fit in with quick-drying stains and lacquer. Ways have been found to speed up the dry of "quick drying" fillers so that they may be recoated in two to three hours.

Wiping; Drying

The filler should be reduced with a solvent such as solvent naphtha to an easy working consistency. The proportion of 10-lbs. to the gallon is about right. Better filling is obtained if the filler is worked into the wood pores with a brush. After drying a few minutes, it should be wiped off. A trial will soon tell just how long it should set before being wiped. Hemp (burlap) or sea moss is used to work the filler further into the pores, wiping across the grain of the wood. It is then wiped clean with a dry cloth, this time, wiping with the grain.

This wiping operation is very important. If the filler is too wet, there is danger of pulling some of it out of the pores. If it is too dry, it will not wipe clean and the wood surface will have a muddy appearance. On very large pieces, only as much work should be filled at a time as can be wiped clean at the proper time.

Before lacquer is applied, the filler must be bone dry. Undried filler results in pitting and gray pores. Pitting is usually caused



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by the escaping solvent that was used in reducing the filler. Gray pores are caused by the wet pore precipitating some of the lacquer solids. A poor grade of solvent in the filler will increase the danger of these faults.

Where work must be rushed, it is sometimes advantageous to thin the filler with toluol, as it is less apt to affect the lacquer than naphtha.

In the case of our table made up of several woods, we sprayed non-grain-raising stain all over it and then put wiping stain on the pedestal. We will now put filler on the walnut top. None is needed on the close-grained wood in the pedestal.

The Sealer Coat

After the filler is thoroughly dry, a coat of lacquer sealer is sprayed on. On some work, such as occasional furniture, high viscosity cotton sealer is used. The difference in price between this sealer and a high grade low viscosity sealer is so slight that the latter is usually preferable. As a rule it gives a fuller finish.

Shellac finds favor with some finishers. Many of the old timers prefer it; they used shellac before lacquer makers learned how to make lacquer sealers. Shellac does have the virtue of holding lacquer coats out on the surface better and it is lower priced. Lacquer sealer dries quicker and is easier to sand. Many finishers will add 25% to 50% mixing lacquer to their shellac. This lacquer is made with an alcohol-soluble cotton and is miscible with shellac.

Shading Lacquer

Following the sealer coat a shading lacquer is sprayed on light streaks in the wood that the non-grain-raising stain did not darken sufficiently. It is also used to feather in whatever highlights are desired; for instance, the panels in a bed or dresser will be shaded around the edge and feathered out to a lighter field in the center.

This shading lacquer is misted on so lightly that it dries almost at once. As a rule, the first lacquer coat follows it immediately. Sometimes two spray guns are used at one booth, one for shading and the other for lacquer. In this way, the work is handled only once for both operations.

Finishing Lacquer

In applying lacquer coats the general tendency is to rush the work. Lacquer dries so rapidly, it is very easy for a finisher to want to put the next coat on too soon. The film should dry clear through and this requires several hours. Shops making pianos and very high grade furniture usually limit their schedule to one coat of lacquer a day. I know many shops making cheaper work that apply a coat of sealer and two or three coats of lacquer in one day. For average, good work, I prefer to limit the schedule to two coats of lacquer in one day.

When a coat of lacquer is applied over a coat of lacquer that is still wet, the succeeding coat will bite through the wet one and sink into it, with the result that the finish is not as full as it should be for two coats. Many times two coats properly dried will look as full as three coats that have been rushed.

Just now, work is being done along the line of force drying each lacquer coat so that three or four coats may be applied in one day, and still prevent shrinking

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of the finish. First results look gratifying and if final tests are as good, many plants with limited space will probably install conveyor lines and drying tunnels for this work.

In the final installment of this article, to appear next month, the author reveals some practical information about lacquers — their solid content, application, patching; gloss and flat lacquers, blooming troubles and the rubbing of lacquer finishes.

Joins Maas & Waldstein Co.

Mr. George Atchue, formerly demonstrator and instructor for the Mischalk Shoe Machine Co., and well known to the shoe manufacturing industry, has joined the sales organization of Maas & Waldstein Co., makers of industrial finishes and Solac cements, Newark, N. J. Mr. Atchue will cover the shoe manufacturing industries of the East and will service users of Maas & Waldstein leather finishes and Solac shoe cements. His long experience as foreman and superintendent in various shoe manufacturing companies admirably adapts him for this work.

Coal-Tar Products

The Neville Co., Neville Island, Pittsburgh, Pa., has published a comprehensive folder which gives a condensed complete listing of Neville coal-tar products, giving uses and pertinent data in a concise form under the headings: Synthetic Resins, Solvents, Plasticizing Oils, Oils and Tar Products. On page 2 is a graphic derivation chart of coal by-products. These valuable reference data are available upon request to readers of INDUSTRIAL FINISHING magazine.

Neoprene Notebook

The first issue (Vol. I, No. 1) of a new publication, "The Neoprene Notebook," (4 pages 8½x11-in.) has just been released by the Rubber Chemicals Division, E. I. duPont de Nemours & Co., Wilmington, Dela. This publication is planned to give the engineer and the manufacturer engineering information, laboratory data, and application reports on neoprene so that he will have this material readily available when considering his next application.

Plant Expansion of $11,000,000 Announced by Sun Oil Co.

A program of plant expansion and development, involving capital expenditures of $11,000,000 during 1938 has been announced by the Sun Oil Co., Philadelphia, Pa., following its adoption by the Board of Directors. The work will be directed to expansion and improvements in the Company's two chief refineries, at Marcus Hook, Pa., and Toledo, Ohio. The building program aims not only to increase the capacity of present plants, but to adapt them to important new refining processes. These new processes will make possible larger recoveries and improved quality of the most valuable elements from crude oil; and at the same time will reduce the costs of refining. In announcing the year's program, J. Howard Pew, president of the Company, said:

"Work will be started on these improvements within the next few weeks. Inasmuch as the materials to be used must be produced and fabricated especially for our purposes, it means that practically the entire expenditure will go into wages for labor. About 2,000,000 man-hours of labor will be required in the erection of plant and structures in addition to employment in producing the materials.

"The fact that the Company is entering upon this expansion program at this time is evidence of our confidence in the basic soundness and permanence of the American competitive system of economics and our institutions of democratic Government, notwithstanding certain temporary political trends which if long continued would inevitably lead to industrial disaster.

"Business and industry are the real sources of employment and guarantors of prosperity. We believe there should be no interruption of the continuous modernization and improvement of plants, equipment and technical processes. Only through such progress is it possible to reduce the consumer's prices for our products, to increase wages, expand employment and raise the standard of living. Confidence that the sound judgment of the American people is and will continue in accord with these principles, the Company has approved for 1938 one of the largest budgets of capital expenditures that it has ever adopted."

AIR DRYING ALUMINUM SYNTHETIC

66E-656

is an *air-drying* Aluminum Synthetic which is tack free in 20 minutes.

This material provides a finish of exceptional brilliance and smoothness, has excellent adhesion, durability and weathering qualities.

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Why Synthetic Coatings

ARE SO DESIRABLE ON SHEET METAL PRODUCTS

by Michael Forchione
Berger Manufacturing Co.

Finisher with a large sheet-metal products firm tells why he likes synthetic coatings, and offers a few suggestions about how to use these new materials successfully.

TO MY MIND, the modern "up to the minute" metal finish is a synthetic enamel. As a general rule I believe it is safe to say that, due to its higher solid content, a synthetic enamel has greater hiding power than the nitrocellulose-base materials. However, for best results I prefer that the synthetic enamel coating be baked, as this makes a harder more durable finish.

Today, in metal finishing, color plays an important part. Customers buying metal products or equipment will often demand a matched color job, which will have to match perfectly in the desired product. However, more of this later.

At this time I would like to discuss the cleaning and preparing of the metal for the finishing room. Cleaning plays an important part in finishing, as it always has, but now it is done by a more efficient and modernized method through the use of chemical tanks and conveyor systems. If cleaning is done with naphtha or a similar fluid, the fabricated metal should be run into a hot oven afterward, to insure the driving out of all the grease and oil that may be lodged in the crevices, laps and seams.

Synthetic enamels do not generally need a prime coat. But when a prime coat is necessary or desirable, the sanding should be done with No. 240 sandpaper, and the surface should be sanded "lengthwise" or "one way" so that sand scratches will not show in the finish. Most synthetic enamels will cover No. 5/0 sand scratches but it is better to use the No. 240, as that gives a smoother surface. The fine abrasive paper is more economical because it does not clog nearly as fast as the coarser papers. If it does clog, hit the paper sharply against a solid corner; this will generally clean the paper nicely.

In cases where fabricated steel needs to be filled in spots, due to spot welds, dinges, or rough steel, synthetic enamels show their su-

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Finishing processes that take a long time to complete are going out-of-date. With modern industrial finishes, processes that formerly took days can often be done in hours... those that took hours, in minutes. This means more rapid production and fewer rejects due to dust spots.

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periority in that the metal will not have to be spotted to seal the filler, thus saving material and time. Also, it saves the foreman oven space, which is often a sore spot with most finishing foremen.

When the steel is ready for the spray room, each piece should be tack-ragged in order to insure a clean job. This is true of all finishes and especially synthetic enamels, as they set up dust free in just a few minutes. If your work is clean from the beginning you may be sure that it will not gather lint from the air in the room itself.

Temperature in Spray Room Compressed Air Pressure

Synthetic enamels s h o u l d be sprayed in a room wherein the temperature ranges between 70° and 75°F. The fabricated steel should not be sprayed when it is chilled, as synthetic enamels have a tendency to orange-peel when sprayed on a cold surface.

Let me say a few words pertaining to air lines. The line should be equipped with traps or filters to remove all water and oil which will accumulate there. This is especially true if the air has to travel any great distance to reach the spray booth. Another thing that will help eliminate your moisture trouble is to drain or "blow out" the air separator every morning or evening, or just before starting spray operations. Also, if the air separator is the kind that has a removable filtering medium, such as cotton waste, I would suggest changing this every day.

While on the subject of compressed air, I might mention the fact that I have found a minimum of 60-lbs. and a maximum of 80-lbs. are best suited to ordinary synthetic enamel spraying. If you use less than 60-lbs. pressure the spray gun will not atomize the material correctly; you will find a large amount of orange peel present in the work because the enamel will not flow out satisfactorily.

Also, a heavy mist is present which will give your finish a freckled appearance. On the other hand, if you use more than 80-lbs. pressure you will be wasting considerable materials and you won't get a heavy enough coat on your work. Chances are that the spray would be dry, necessitating another spray operation.

If a pressure tank is used, I have found that pressure of 12 to 15-lbs. in the tank is sufficient—accompanied by a 70 to 80-lbs. pressure at the nozzle of the spray gun.

In many cases, the manufacturer of your particular material can give you the proper viscosity reading for spraying. If not, I would suggest that you test the material at different readings until you find what is best suited for your own particular line of work, and then hold it there for a uniform finish.

Synthetic Coatings Do Not Absorb Graining Inks

I have found that synthetic enamels have a big advantage over either the cellulose or oil-type enamels in the graining room. The reason is that due to the higher absorbing quality of both the lacquer and the oil-type enamels (or ground coats) an ordinary washing-off of the graining ink would necessarily mean either a sanding or a respray operation. This is because these lacquer and oil-

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type materials absorb some of the graining colors or ink, thus discoloring the ground coat which, if regrained, seldom matches previous grainings.

On the other hand synthetic enamels do not absorb graining ink, hence they will not show any discoloration of the original color if their surface is grained and then it becomes necessary or desirable to wash off the graining. In cases of this kind the use of a synthetic ground coat, which can be easily washed clean of graining ink, will save a sanding operation and a possible respraying of the surface. Here again, the time element enters the picture, as the synthetic ground coats only have to bake one hour at a 260°F. to enable them to receive and hold a clear lacquer coat which is invariably used over the graining.

Matching Colors Is Easy

We now arrive at an important place in today's paint shops—the shading or tinting room. As I previously stated, the paint shop must be ready to meet any color demands at a few moments' notice. Any foreman finisher will admit that a good shader is practically indispensable in a modern shop. Oftentimes a large order depends upon his ability to match the customer's sample perfectly on short notice. A skillful shader will often match samples in the home shop with the materials on hand, whereas if he sent the work out to be matched, it might take from two days to two weeks to get it back.

There are times when only a quart or two of material is needed to finish a small job and the finisher can get it out in an hour or so, thus saving his company valuable time. Here, too, synthetics show their superiority in that we can obtain shading colors which, when added to the original materials, need no added varnishes, or dryers. Neither do they need extra straining because these colors will not turn the batch seedy or reduce the gloss or durability of the material.

Mixing Equipment Folders

The Mixing Equipment Co., Inc., 1034 Garson Ave., Rochester, N. Y., has prepared and is sending out two 2-color folders which have illustrations and descriptive literature about portable electric mixing machines for the laboratory, paint shop and finishing room.

Maas & Waldstein Exhibit

"Finishes engineered to the job" were exhibited by Maas & Waldstein Co., makers of industrial finishes, Newark, N. J., at the International Heating and Ventilating Exposition, held in New York in January. The exhibit included air-conditioning units, oil-heater jackets, and oil burners finished in M & W finishes specially designed to withstand the service conditions to which each of these products is subjected. Stress was laid on the parts played by good design, color, quality of finish, and wearing qualities in increasing manufacturers' sales.

Superheated Water

If you have any process or operation wherein you might use superheated water (up to 370°F.) send for a reprinted article on this subject—an article being distributed by J. O. Ross Engineering Co., 350 Madison Ave., New York, N. Y. The illustrated article describes the Ross Supertherm System for process heat which has been installed in the new General Electric Co.'s plastic plant at Pittsfield, Mass.

According to the article, this new Supertherm System is effecting a fuel saving of about 30% and is providing other major advantages and economies. Its novel feature, of course, is not merely the use of hot water, but its use at temperatures above 212°F.

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Finishing Brass

In a reference to a recent inquiry about finishing brass in a small factory, I am submitting some suggestions, but am taking into consideration the fact that no great outlay for equipment is anticipated, as the production at the present time does not warrant such an expenditure.

I have found that sulphuric acid dip is a slow method when finishing brass, so I recommend the following method:

Remove all grease and foreign matter thoroughly so that they will not act as a resistant to the acid. Then dip in a nitric acid solution that has been well diluted with water. The amount of water used will depend on how much of the surface you wish to attack. When it is removed from the acid dip, immerse the brass in clear water.

The usual method for polishing is with a buffing wheel and wet or dry compound. However a very fine steel wool can be used to a good advantage, being careful to polish in one direction, preferably lengthwise of the article.

For imitation brass finishes to be applied over steel, etc., some companies merely mix bronze powder and bronzing fluid. When this method is used the powder should be fine and fresh.

I have used a different process which I consider excellent for securing a good imitation finish. First spray a light coat of bronzing fluid over the metal. Then, when the fluid is slightly tacky, dust over the whole surface a liberal coating of very finely ground bronze powder. Bronze powder can be purchased in a shade that very much resembles brass, but unless the powder is ground very fine the best results cannot be obtained.

Caution should be taken to avoid spraying the bronzing fluid on too heavily, because the finish will look "wet." The fluid should be slightly tacky when the powder is sifted on, so that it will adhere. On the other hand, if fluid is too wet it will absorb some of the powder and the final finish will be spotty.

The powder should be dusted on lightly from a shaker can and given ample time to dry before the excess powder is dusted off. —H. H. GLINKE.

Questions Answers

Cleaning and Bleaching Antique Furniture

In the January issue of INDUSTRIAL FINISHING, I notice the I. N. Co. (page 9) asks how to remove the finish from antique furniture.

Apply a good varnish remover and let it soak until you can wipe the finish off clear to the wood. Let the remover do the work. Don't try to do any scraping until the varnish remover has worked all the way through. On flat surfaces use a broad knife to scrape off the thoroughly softened old finish; on legs, slender members and intricate parts, use a stiff brush after the finish is

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nearly off. Then brush over the surface with clean remover. Wipe the surfaces with a coarse cloth and wash with turpentine.

For bleaching there are several good materials advertised in this magazine. Use them according to directions and you will get satisfactory results. Of course, in an emergency and on certain woods, I have used a solution of oxalic acid, following same by washing the surfaces with water, then giving them a final rinsing with vinegar. Following all this treatment, the surfaces must be sanded smooth preparatory to finishing. —J. K. COOPER.

Drain Board Finish

In reference to the request of D. & M. Co. (December issue, page 61) for a finish to be used on laminated hard-maple drain boards, sink tops and work-table tops, I prefer to use hot boiled linseed oil with a little japan drier added. Apply with a brush or wiping cloth. Use two or three coats or applications, letting each one soak in until the surface is practically dry. This is a slow process, but it gives a fine durable finish on a wood surface subjected to standing water, hot dishes and general kitchen service. — J. K. COOPER.

Galvanized Pail Coating

We are confronted with a problem in manufacturing a certain type of utensil that must be made out of galvanized iron for certain reasons in fabrication. Certain parts of the iron require soldering together for proper assembly. This galvanized iron vessel (which resembles somewhat a bucket or pail) is to be used to contain a light solution of copper sulphate in water. Copper sulphate, of course, is very destructive to the zinc coating on galvanized metal, and it is necessary to coat or protect the interior of the vessel in such a way that a reasonable protective coating can be secured. This coating must be an air-dry finish, preferably a one-coat job, and can be of any color.

We would like suggestions and recommendations as to any type of product that can be recommended as satisfactory for this purpose, to be applied either by spraying or by brushing.—D. S. Mfg. Co. (Poultry Equipment).

From our past experience in handling problems of this kind we do not think that any air dry coating will give protection for a sufficiently long time to warrant the application. If these pails could have a clear coating baked on at a temperature between 250° and 300°F., then a finish could be obtained that will be reasonably permanent.

In any case, we would recommend that the finish be sprayed on and not brushed.—G. KLINKENSTEIN.

I suggest an air-drying coating (one application) brush or spray, preferably the latter, of a short-oil (four to five gallon length) asphaltum varnish; one containing pitch would be preferred. I feel certain this would answer the purpose.—M. C. ROBERTS.

From my experience I believe that clear bakelite varnish offers the greatest possibility to prevent a copper sulphate solution

from attacking the galvanized surface. The inquirer does not state the strength of this copper sulphate solution and this may have some bearing on the final result.

I have in mind two bakelite varnishes both of which I expect to try for your experiment. One is a long-oil bakelite resin varnish which is a little slower in drying, but it probably will have the better wearing qualities and greater resistance to this acid.

The other material is a straight bakelite resin coat dissolved in the proper solvents and offers quicker drying and also fair resistance to the acid.

If it were possible to bake these bakelite varnishes I would not hesitate to say definitely that one or the other would accomplish its purpose.—R. J. FAIRBURN.

There are two factors of important consideration toward the solution of this problem. The first factor is that no finish will successfully withstand continuous submersion in water. The second is that with the most water-resistant finish it may not have satisfactory adhesion to galvanized metal. One other factor, while remote but still of almost equal importance, is that the finish should have good adhesion to the soldered parts of the container and should not be subject to being broken down by the soldering flux.

On the face of it, the specification seems almost impossible of attainment for we must admit the fact that the effects of continuous immersion in water would be greatly accelerated by the acidulation resulting from the hydrolytic reaction of the copper sulphate. Copper sulphate ironizes

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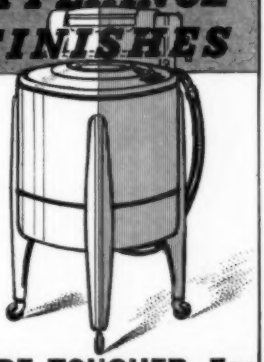

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in water solution, giving an acid reaction. Consequently the adaptability of finish for protective purposes would depend upon the economics of cost of finishing versus additional life of the finished vessel. In my opinion the results could be more efficiently obtained by resorting to a different metal for the construction and then copper plating the interior portion which would be constantly immersed in the copper sulphate solution. I believe you will appreciate my attitude in recommending against the use of a finish for purposes where a finish is not inherently adapted to an unusual use.

In the face of these odds against successful finishing results, the inquirer might try some of the synthetic-resin enamels preferably of the glyptal or amberol type. The glyptal type will probably show better adhesion at the expense of water resistance and the amberol type may give the opposite reaction, but it can be expected that the amberol type will not have as good adhesion as the glyptal. There are a number of these enamels available from numerous nationally known finish suppliers. There may be some advantage in some of the lacquer-synthetics. Regardless of type, that is whether straight synthetic or lacquer-synthetic, the inquirer should select the finish upon the basis of tests for finish acceptance.

Assuming that one of these types of finish will show satisfactory resistance to the copper sulphate solution, I still question whether the finish will have acceptable adhesion to the galvanized metal. The adhesion can be improved by the use of a specially

developed galavanized iron primer (name furnished on request). This is a zinc-dust primer suitable for spray or brush application, requiring a 24-hour drying period before being capable of receiving any subsequent finishing coat. It might be subject to "lifting" by solvents in a lacquer synthetic. Standing alone, the galvanized iron primer has no finishing value but it does provide a satisfactory ground coat with good adhesion to the galvanized metal and will adapt itself to subsequent finishing coats of synthetics. The use of this primer is not asked for by the inquirer but it should prove to be of some merit in this case, and it may enable the inquirer to obtain the desired results, whereas without this primer the enamel would fall far short of service demands.—GREGGS PHILLIPS.

Silk Screening on Glass

In reference to an inquiry concerning silk-screen stenciling on glass in the December issue, page 9, my experience has been that the average silk-screen paint, although suitable on such materials as wood, metal, cardboard, etc., is sometimes unsatisfactory when used on glass. The difficulty, of course, is due to the transparency of glass, and also because glass affords a surface of poor adhesion because of its smoothness. Another one of the difficulties encountered is that some silk-screen paint has a tendency to creep or smudge.

To overcome these difficulties and to meet a special emergency, I have used the following mixtures: Take colors ground in oil; add an equal amount of fast-dry-

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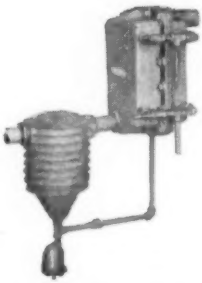

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ing clear varnish to act as a binder; then reduce the mixture to a working consistency with japan dryer. For a quicker-drying mixture I advise colors ground in japan dryer. To these colors add an equal amount of thick quick-drying clear varnish, so that the paint will adhere to the glass. Reduce to a working consistency with japan dryer. If you find that the mixture drys too rapidly, add a few drops of linseed oil.

If you desire a high gloss, the glass can be silk-screened the second time, using thick varnish. To assure success use a mixture with a very high color pigment content.

In cases where you would prefer to use a commercial silk-screen paint, but are bothered with transparency, merely add color pigment ground in japan dryer.—H. H. GLINKE.

Finish on Old Cherry Turns Milky White

For the last several months I have been getting complaints about the finish going bad on old cherry pieces that I have refinished. Some of the pieces have been finished five or six years; others only six months. The finish turns a grayish or milky white color, beginning at the bottom and gradually working upward.

In our finishing process we usually omit filler on old cherry because it makes the wood darker. We apply orange shellac directly to the wood with a brush, using a 3½ to 4-lb. cut. Then we sand the surface real good and apply another coat of shellac. We either

sand or rub the second coat with steelwool of No. 2 or No. 1 grade. Sometimes we even use a third coat of shellac; for example, on a few pieces that have gotten by me without being sanded enough in places—these have had to have a third coat to get a level surface. Then we spray on the varnish, usually apply two coats. We rub with either No. 1 or 0 steelwool, or sand with No. 0 to 3/0 sandpaper. Then we rub with paraffin oil and pumice.

We are using a nationally known brand of varnishes. We buy both dull luster and gloss varnishes but mix these before using. We mix the two in the proportion of 45% gloss to 55% dull. Some of the pieces that have gone bad were rubbed with No. 0 steelwool and waxed.

Industrial users of finishing equipment now demand that the spray equipment manufacturer come to them with the knowledge of compressed air, exhaust engineering and air conditioning, as well as the many complex problems of material handling.

The time that it has taken for the finish to go bad varies from six months to three years. The trouble seems to start toward the floor and gradually works up to cover the entire piece in some instances.

So far, all the pieces that I will have to refinish have been kept in a house heated with hot air or steam. The thermometer rarely ever gets below zero here (Tennessee) and in the spring and fall we usually have quite a lot of rain. My finishing room is not entirely cut off from the rest of the shop, therefore it is sub-

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Would you advise changing to a lacquer finish? The new wood that we use in repairing and building furniture is air-dried only.—H. R. Mfg. Co. (Antique Furniture).

I have done dozens of old cherry pieces but have never come into that trouble. You state that you are using air-dried lumber only. There may be too much moisture in your lumber. Shellac will turn white at the least sign of dampness, but it shouldn't take as long as you state for it to show up. It may be that your rubbing oil doesn't agree with the flat varnish you are using.

It is not good wood-finishing practice to put so much shellac on under varnish, as these materials are different in their drying characteristics. This method of finishing may cause your varnish film to become brittle. Perhaps you will find that this causes part of your trouble. Wax wouldn't have anything to do with this.

Sometimes camphorated oil will remove whiteness. Rub the oil over the piece and continue rubbing until the whitness diappears; or you might dip a rag in alcohol, wring it nearly dry, wipe the surface of the piece, and see if that will take it out.

I would refinish the newer pieces to avoid further trouble. Clean off the old finish with regular varnish remover.

I would either stick to a straight all-shellac finish, or use only a thin coat of shellac followed by your three coats of varnish.

You will get a nicer smoother

job with shellac if you will add to it what we finishers refer to as "waterproof mixing," or "shellac mixing." You will have less rubbing. Mix the "waterproofing" according to directions and you can do away with your pumice stone.

You should use a finer wool for rubbing, as these grades you mention are apt to be so coarse that they will scratch your finish. Use No. 0 or 2/0 for the first rub, and then either No. 3/0 or 4/0 on final rub. Make a pad of No. 4/0 steelwool; dip in water and a little oil and rub your work off clean. To wax the surface, dip your pad in liquid wax; rub and polish.

You can use your spray with this shellac mixture, only you make your coats thin to avoid orange peel. Avoid the use of lacquer, as you will run into trouble if you are using much varnish remover to clean off old finish.

Eclipse Air Brush Co. Announces New Spray Gun

A new high-speed all-purpose spray gun for operation at either high or low pressure, with internal or external atomization, is announced by Eclipse Air Brush Co., Inc., Newark, N. J.

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Blue-Green Dye for High Heat

I am at the moment trying to obtain a pigment or dye, blue and green, that will, when made into a cellulose enamel, withstand a temperature of 210°C. (410°F.) for an indefinite period; the blue to be a greenish blue, such as Prussian. I am requiring this for decorating gas and electric fires. Can you give me the name of any firm in the States or elsewhere who manufacture such a product? —L. D. E. (Birmingham, England).

In reference to a material that would withstand 410°F., you must take into consideration the vehicle as well as the pigment, as there are very few organic coatings that will withstand this temperature.

You mention the use of a cellulose material. You should not use a cellulose nitrate, as this material will readily decompose. However, there are some cellulose thermo-plastic materials, such as acetyl butyl cellulose, cellulose acetate and ethyl cellulose, which might withstand such temperatures.

The blue to use for such a finish would possibly have to be a Monastral type blue pigment which will withstand a temperature of 700° to 750°F. without changing color. It is chemically a molybdate type of pigment and, no doubt, you will be able to obtain such a material in England. —M. H. CORBIN.

In my opinion, the use of dye to color cellulose lacquers to stand a temperature of 410°F. is rather

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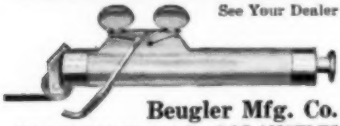

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an impossibility. The nature of nitrocellulose and the dye one may propose to use is such that in mixtures they do not get along very well together. Furthermore, as a general rule, inorganic pigments will stand far better heat than the organic dyes. Being organic in nature, they will break down under heat. Moreover, they will start to break down the nitrocellulose vehicle itself from the very outset.

In my opinion, therefore, you have to resort to commercial pigments rather than to dyes. Prussian blues in general will not stand very much heat. However, ultramarine blues have the capacity of standing a far greater amount of heat than any other blue that I know of, but ultramarine blues are not extensively used because of their lack of covering. A common everyday example of an ultramarine blue pigment being subjected to excessive heat is the Buick motor block. If there is a change in color, it is not due to the action of heat on the pigment, but due to action of heat on the vehicle which, incidently, is a synthetic resin type material. A nitrocellulose type of material with ultramarine pigment on a Buick engine will break down much faster and the color change will be more pronounced in a very short time. Incidently, the Buick motor block under operation gets a temperature of approximately 900° F., especially close to the combustion chambers.

The ultramarine blue pigments can be secured from the Standard Ultramarine Co., or the Calco Chemical Co. My personal opinion still stands that a nitrocellulose type material, even with ultramarine blue pigment, will not serve the purpose, that is, with-

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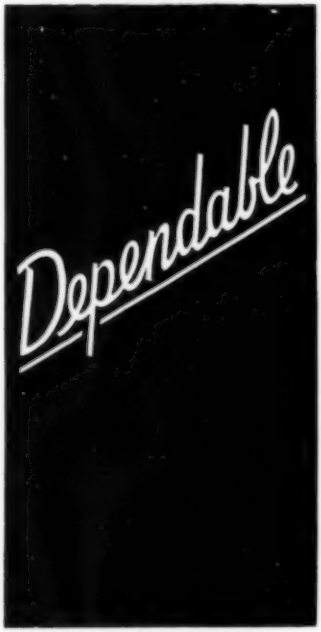

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VARNISHES
You'll Finish Right

stand 410°F. for an indefinite period. It will very likely do so for a much prolonged period in a synthetic resin vehicle of the glyptal type.

You might investigate the British source of supply for Blue Hi-Heat pigments. The Nobel Chemical Division of the Imperial Chemical Industries have new pigments which I understand will stand fairly high degrees of heat and these, I believe, are very closely related to the Monastral blues which are marketed in this country by duPont. — KAM N. KATHJU.

There is a pigment known as Monastral Blue (which, by the way, was developed in England and has recently been prepared in this country) that is exceedingly fast to light and heat. This is the fastest of the dyes.

Other than the dyes I would recommend a product such as a true cobalt blue or other ceramic color. For a green, similarly a ceramic green could be used or, if the Monastral Blue serves your purpose, then a mixture could be made of Monastral Blue and a yellow such as zinc chromate.— G. KLINKENSTEIN.

To Clean Caked Hooks

Referring to a question on the above subject that appeared in December issue, page 52, I would add to that lye solution (which the company says isn't strong enough) three handfuls of caustic lime for each pound of lye, and enough paperhangers' paste to thicken the whole solution to a paste form. Then apply it to the iron or steel hooks caked with

accumulations of stain, lacquer, sealer, varnish, enamel, etc., and let the paste covered hooks lay for a while. The paste and lime prevent the lye from drying out so quickly and, as a result, this strong remover is kept moist and held in close contact with the caked finish, which it softens, usually in a short time.—J. COOPER.

Electroplating Service Bulletin

A new duPont booklet of eight pages 8½x11-in., bound between heavy paper covers, gives interesting technical information about the removal of sodium carbonate from cyanide plating solutions. It outlines the chemical analysis of carbonates and the results of laboratory and commercial tests conducted with solutions of cadmium, copper, zinc and silver. Copies can be obtained by writing the E. I. duPont deNemours & Co., Grasselli Chemicals Department, Wilmington, Del.

P. J. Zuris Joins Ace Laboratories

P. J. Zuris, chemist and sales engineer with the Excelsior Varnish Co., for 13 years, has severed his connections and will devote his entire time as a head of Ace Laboratories, North Ridgeville, Ohio. This company plans to manufacture a full line of high-grade industrial finishes.

Mr. P. J. Zuris has had a wide experience as research chemist with a number of industrial concerns including the Sherwin Williams Co. For many years he did considerable research work and made independent investigations in paints, lacquers and other industrial products.

Letters from I. F. Readers

(Continued from page 8)

as the formulas being used to shape the design and bead, giving a hard smooth surface with the whiting. We would appreciate any information you can give us along these lines as we are in production on circular and arched-top frames and are not getting satisfactory results.—O. Art Co. (Framed Pictures).

Bowling Pin Lacquer

We want to match the finish on our bowling pins and have been referred to you for this information. This appears to be a very hard lacquer with a little white tint. We will greatly appreciate your cooperation in solving this problem.—W. M. C. (Masonic Club).

Reliable

— Bleach —

Color Control

IN WOOD

BLANCHIT

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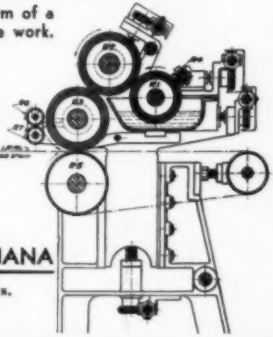
. . . for coating any flat surface material, whether in form of a heavy stiff board or a light flexible sheet for high grade work.

THE NEW MODEL T-R

Francis Coating Machine

EST. 1880.



This machine is fitted with Metal, Rubber, Composition, or whatever kind of Rolls are required, and provision is made for quick change from one kind of Roll to another. It will spread uniformly—varnish, paint, adhesive, etc., on metal, wood, paper, leather, cloth, and other materials. **Largest and Most Complete Line of Coaters, Spreaders, Mixers, Presses, etc.**

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We build many other Models in different combinations.

Cementing Celluloid

Where can I obtain information in regard to cementing celluloid together without it puckering or pulling in or shrinking? What kind of solvents are used for such purposes, or can two pieces of celluloid be cemented together without the use of solvents and not take too long a time in drying?—T. D. R.

Flock Decoration

We are having several calls for merchandise such as gym suits, warm-up coats, sweat shirts, and similar types of sport wear, lettered and designed in the new flock process. Please advise if this work is difficult to put on and is the equipment expensive? Do you know of any one here in Connecticut that does this type of work?—A. R. Co. (Men's and Boys' Wear).

Solvent Recovery

Please furnish me the name of the solvent recovery still that is mentioned on page 24 of INDUSTRIAL FINISHING for December, 1937 . . . . Or have some of the manufacturers of such equipment get in touch with the writer.—R. R. Co. (Truck Trailers).

One manufacturer's solvent recovery still is illustrated and briefly described on page 50 of that same Dec. issue, along with the company's name and address — the Barnstead Still & Sterilizer Co., Forest Hills, Mass. Another manufacturer of similar equipment is S. F. Bowser & Co., Ft. Wayne, Ind.—Ed.

Dipping Equipment

On page 65 of the December issue of INDUSTRIAL FINISHING, I noticed a letter from H. & O. Co., who would like to find some satisfactory means to finish handles, etc. I believe our dipping equipment would prove to be what they require. Would you be good enough to give me their full name and address?—Apex Products Corp.

Enameling Oven

We have intentions of building a small enameling oven, and would appreciate it greatly if you have any specifications in construction that you could offer us. — Y. Mfg. Co. (Adv. Displays).

We have no plans or specifications for building homemade ovens, as we do not indorse this practice. We

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A compact efficient Air Valve . . Exactly suited for Surface Cleaning and for removal of dirt dust chips and moisture by Compressed Air . . Made of Bar Brass and Stainless Steel . . Leakproof . . No Packing Glands . . Streamlined . . No Buttons or Levers. Operated by a slight reflex of Air Hose.

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recommend that you consult some of the established oven manufacturers as they can furnish equipment that is guaranteed to produce satisfactory and economical results.—Ed.

Sheet Celluloid

Will you please send me any names of concerns that manufacture celluloid for use, just as some manufacturers use for covering the lids on hampers?—C. L. Mfg. Co. (Venetian Blinds).

Graining Transfers

Will you kindly send me information regarding concerns manufacturing transfers for imitation graining for refinishing cash registers and other office equipment?—C. B. A.

Grain Reproduction

We would like to get in touch with someone who could give us an oak grain reproduction on a fiber base material, or a decalcomania reproduction of oak. Can you give us the names of several concerns in this line?—T. A. Co. (Plumbers' Woodwork).

Lithographers' Rolls

We are interested in rolls used for painting such as lithographers use when the sheets are painted flat and made up afterwards. Can you furnish us the addresses of firms making this equipment?—I. A. Mfg. Co. (Hardware Specialties).

Stain; Size Filler

Please inform us who makes a spraying stain which will not raise the grain and can be used with lacquer. Is there a material that can be used to size veneered work before sanding and which will also act as a filler?—L. Piano Mfg. Co.

Kelsan Products Appoints Representative

Kelsan Products, manufacturers of "Kelsanite" spray booth coatings, St. Clair, Mich., announces the appointment of Mr. Fred B. Duncan of 9 S. Clinton St., Chicago, Ill., as representative to cover Indiana, Illinois, Iowa and Wisconsin.

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U. S. and Possessions.....$2.00
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EDITORIAL

Equipment Progress

The past year has seen many timely improvements in conventional coating equipment. Spray guns have been altered to improve atomization, to economize on air and materials, and to handle special materials such as strong bleaches. Roller coaters, centrifugals, spot coating machines and dipping equipment have been constantly improved.

The most interesting and striking developments appearing currently are in the coating machine field. Many and remarkable are the devices that are now coating, perfectly and with amazing speed, odd articles of merchandise from hair pins to sewing machines. Magnetic spot coaters perform remarkable feats on partially coated and patterned surfaces.

The current coating machine development, which will open a relatively new and broad field, is that of the multiple-color cloth printing press. More specific and complete data on the possibilities and adaptations of this interesting process will be made public in the near future. Not only is a new field opened here for specific materials, but there is an economic aspect which will be of widespread interest in the textile fields.—W. T. SMITH.

Furniture Style Highlights for 1938

According to Rosalie Flank's American Furniture Mart Style Review, the style highlights centered around the new modern, and a significant trend was noted in the refined styling reflected in all branches of the industry . . . . Cabinet woods have come from behind their camouflaged finishes of the past to reveal the true beauty of natural wood, finished to enhance rather than hide the natural color, beauty and graining. Mahogany and walnut were used either in their own coloring or bleached to heighten their appeal; other standard cabinet woods took on a new beauty as heavy stains were omitted and skillful finishing brought out the heretofore hidden qualities of the true wood. Pine took another step

In the past year it has been proved that striping wheels for different problems are necessary, and these problems vary so greatly that in many cases it requires a wheel built to individual specifications. For instance, the double wheel striper which runs two stripes simultaneously. The manufacturer must have, not only the information as to the width of each stripe, but also the exact distance between these stripes. The manufacturer of convex-surfaced or concave-surfaced wheels, which are required in striping routings or grooves as well as striping on beading or molding, must have exact specifications as to the width and depth of grooves and the curvature of the surface, either at the bottom of the groove or on the beading.

The producing of wide stripes is a more difficult problem and we are constantly working to this point. While we have not been able to produce a satisfactory striping wheel that will produce a stripe beyond ¼-in. in width, it goes without saying that the narrower the wheel, the easier it is to produce perfect striping, as the wheel must rest firmly on, and at right angle to, the surface being striped.

forward in the fashion picture, as pine frames on upholstered pieces and knotty pine veneers on case goods made further appearance. Fruit woods have come into their own on new modern, and considerable bleached mahogany and bleached walnut were shown on newly designed modern case goods and upholstered pieces. Bleaching took a new note as manufacturers introduced several cuts of a single wood on one suite, then bleached the entire piece, each type of veneer taking the bleach in different intensity, thus presenting a new pleasing effect that is scheduled for future popularity.

Second in importance in the style picture was 18th Century, with Sheraton and Hepplewhite leading over elaborate Chippendale styles of the past.

French seemed to drop somewhat in popularity, in some instances s l i d i n g into the lower price brackets. A number of lines either substituted French Provincial or d r o p p e d a number of French pieces from the line.

Early American and Colonial pieces continued their steady pace with new fabrics and new finishes, combined with new comfort features, heightening their appeal.

N o v e l t y occasional furniture followed period styles but lagged behind new modern trends as set by the upholstered lines. Receptacles for growing plants, French cigarette tables and English tea tables held the spotlight. Bleached occasional pieces seemed suddenly to have dropped from the picture. Breakfront cabinets appeared in greater profusion than heretofore and new desks stressed leather inlays and period designs. Many manufacturers, however, voiced the belief that they would probably again "go modern" to meet the demand created by current upholstered styles.

High points of the m o d e r n trend included peg shaped legs, smooth flowing curved lines, simple direct styling gracefully blending of traditional and modern schools of design, and beautiful finishes and upholstery especially designed to glorify the new creations . . . of attractive furniture.

In outdoor furniture solid colors with contrasting bindings were favorites, with decorative motifs, centered on the back cushions, the only decoration.

Dubonnet emerges as the new number one color in outdoor furniture—and was used in many interesting combinations on all types of new pieces.

Tables and chairs reflected the outstanding work of some of the country's best modern designers and were marvels of grace and comfort. Pierced and latticed metal presented a new treatment and many of the tables made use of glass tops revealing receptacles for growing plants in the base structure.

Juvenile furniture continued in the modern vein with a new delicacy of treatment promising approval by the parents. Decorations of familiar story book characters or games and events understandable to children were noted. Enamel has again returned to popular favor with white and modern pastel shades replacing to some extent the birch and maple suites of the past.

Improved Finishing Materials

The contributions of scientific research to the automotive industry have been as far-reaching in their social implications as in the case of the textile industry. To begin with, chemical research evolved, about 1921, quick-drying, low-viscosity lacquers based on proxylin made by treating cotton linters with nitric acid, a development which made possible the mass production of automobiles by cutting down the time required for finishing a car from weeks to hours, to say nothing of the superior beauty and durability of these new pyroxylin finishes.

More recently, the chemist has contributed still another type of quick-drying finish, based on synthetic resins having their origin in coal tar and vegetable oils, which bids fair to rival the pyroxylin lacquers in importance. The chemist has also given us coated fabrics in place of the leather formerly used for upholstery, and in this connection it is of interest that to supply leather in yardage equivalent to that of the pyroxylin-coated "leather cloth" now used, a vast acreage would have to be devoted to the raising of cattle for hides.—DR. CHAS. M. A. STINE (duPont Co.)

Tawdry Finishes Out

The gaudy semi-opaque finishes used on some furniture, in an ineffective attempt to hide poor construction and woods that lack character or quality, are becoming nauseating to furniture buyers. Even the people who can only afford to buy low-priced furniture are turning away from them. It is high time that manufacturers of cheap furniture abandon the use of such finishes. The pendulum has swung to its limit in this direction, and goods with a tawdry finish are becoming "distress merchandise" in most localities.

More and more people now have access to retail establishments that show and sell good furniture and these stores are making their places attractive by fixing up completely furnished rooms inside their stores. They are also using other methods to attract people into their places of

business. Shorter work days allow more people to visit furniture stores, so there's more "window shopping" being done before furniture purchases are made.

A greater number of people who anticipate buying furniture are committed to the policy of making several inspection tours to look over high priced furniture. Even though they can't afford to buy it, they inspect it carefully for style, construction and finish. From the salesmen and from their own observation they obtain more reliable information about what good furniture looks like and how it feels. After looking over a considerable variety of high quality furniture, they are in better position to judge for themselves the relative merits of furniture in the medium-priced and lower-priced lines. Naturally, this enlightenment strongly impresses them with how awful and how impossible the tawdry finished furniture really is. They want none of it, especially when they can find plain, serviceable designs in durable woods, such as maple and oak, finished natural with clear coatings that reveal the wood in a manner that is more like the finish on fine furniture made of mahogany, walnut or other high-priced hardwoods.

It is my belief that there was 400% more striping used in the decorative finishes of products during 1937 than during any previous year. And, inasmuch as the cost of producing the stripe is so inexpensive and the results are so gratifying from a decorative standpoint, it is also my belief that 1938 will continue to show tremendous advancement in this field.

Styling Your Products

Since the styling or creation of original and attractive designs for industrial products has become such an important factor in the production, advertising, and merchandising of manufactured products, a number of individuals and organizations have become specialists in this line of work. A circular sent out by one of these industrial stylists disclose some significant and timely points along this line — something for manufacturers to think about. A few excerpts from the bulletin follow:

"To whom will you trust your styling problems?

"Since good style has become a merchandising necessity rather than a luxury, almost every manufacturer has a design problem. Utility is no longer an excuse for ugliness. You, as a manufacturer, want the appearance of your product to help sell it. Good styling puts its best foot forward. But remember that styling is the reflection of the designer's background of experience. The man who styles your product should be a highly specialized professional, adequately staffed to service you effectively and intelligently . . . .

"The fundamental fitness of good design is consistently apparent to the consumer. We do not believe in unnecessary and expensive surface embellishment . . . . This service includes the preparation of colored visualizations, scale models, selection of color treatments, and dimensioned drawings clearly interpreting the final design."

INDUSTRIAL FINISHING believes that modern styling and design

are quite as important as substantial construction, quality materials and durable attractive finishes, inasmuch as all of these factors affect sales results.

Better Ventilation; Fewer Headaches

How the modern spray system has benefited workmen in finishing rooms by its necessary exhaust apparatus at each spray booth, is emphasized by a letter we received recently from an experienced finishing foreman who has also served in the capacity of finishing materials salesman. Writing about "the good old days," he says:

"Many were the times that an operator awakened from a night's sleep after putting in the previous day toiling at a bench in a close, heated, foul-aired room, to find that his head felt like it was as large as a barrel—which was not much incentive to return to the misery of the previous day .... There were 12 to 14 workmen brushing by hand in this room the whole day long, and by the time 10 hours (in those days) were up, the air in the room would be so dull, heavy and full of turpentine odors that it would nearly close a man's eyes.

"In those days, on high grade furniture, four and five coats of varnish, applied in this manner, certainly gave the brush hand all the work he could handle—along with the added discomfort of the unhealthy working conditions."

What a remarkable improvement in the industrial finishing rooms we know today, with their air-conditioning, uniform heat, adequate lighting, cleanliness, safety and labor-saving apparatus for doing more work with less effort and in fewer hours.

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Maas & Waldstein Co.

Oxford Varnish Corp.
Raffi & Swanson, Inc.
Roxalin Flexible Lacquer Co.
The Sherwin-Williams Co.
Stanley Chemical Co.
The Stille-Young Corp.
Varnish Products Co.
Zapon Corp.

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The Leon J. Barrett Co.

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J. O. Ross Engineering Corp.

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V. J. Dolan & Co.
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Rockford Varnish Co.

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Rockford Varnish Co.
Rudd Lacquer & Sealer Co.

FLAT VARNISHES

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Rockford Varnish Co.

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Oxford Varnish Corp.

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Eclipse Air Brush Co.
Paasche Airbrush Co.

JAPANS

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James B. Day & Co.
V. J. Dolan & Co.
E. I. du Pont de Nemours & Co.
The Glidden Co.
Cudner & O'Connor Co.
Egyptian Lacquer Mfg. Co.
Hilo Varnish Corp.
Impervious Varnish Co.
Indianapolis Paint & Color Co.
Jamestown Paint & Varnish Co.
Lilly Varnish Co.
Maas & Waldstein Co.
Thos. E. O'Connor Co.
Oxford Varnish Corp.
Raffi & Swanson, Inc.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer & Sealer Co.
The Sherwin-Williams Co.
Stanley Chemical Co.
The Stille-Young Corp.
United Lacquer Mfg. Corp.
Varnish Products Co.
Zapon Corp.

MASKING LIQUIDS, PASTES, TAPES

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Egyptian Lacquer Mfg. Co.
Industrial Tape Corp.

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E. I. du Pont de Nemours & Co.
Egyptian Lacquer Mfg. Co.
The Glidden Co.
Hilo Varnish Corp.
Maas & Waldstein Co.
Parker Rust-Proof Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer & Sealer Co.
Stanley Chemical Co.
Varnish Products Co.

OVENS

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J. O. Ross Engineering Corp.

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Crown Spray Gun Mfg. Co.
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Eclipse Air Brush Co.
The Alex. Milburn Co.
R. C. Mahon Co.
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E. I. du Pont de Nemours & Co.
Oxford Varnish Corp.

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Kelsan Products

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Ruemelin Mfg. Co.

SANDING MACHINES
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Paasche Airbrush Co.

SEALERS
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Rudd Lacquer & Sealer Co.

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Rockford Varnish Co.

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American Posters Co.
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U. S. Industrial Alcohol Co.

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Eclipse Air Brush Co.
Alex. Milburn Co.
Paasche Airbrush Co.
Wendell Mfg. Co.

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James B. Day & Co.
V. J. Dolan & Co.
Cudner & O'Connor Co.
Indianapolis Paint & Color Co.
Lilly Varnish Co.
Thos. E. O'Connor Co.
Rockford Varnish Co.
The Sherwin-Williams Co.
The Stille-Young Corp.

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Universal Shellac Stick Co.

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K. H. Gettner Shop
Wendell Mfg. Co.

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Egyptian Lacquer Mfg. Co.
United Lacquer Mfg. Corp.

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Wm. A. Juergens Co.

TAPES, MASKING
Industrial Tape Corp.

THINNERS
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Egyptian Lacquer Mfg. Co.
Maas & Waldstein Co.
Raffi & Swanson, Inc.
Roxalin Flexible Lacquer Co.
Rudd Lacquer & Sealer Co.
Sun Oil Co.
United Lacquer Mfg. Corp.
U. S. Industrial Alcohol Co.
Zapon Corp.

TOUCH-UP SPRAY OUTFITS
Binks Mfg. Co.
The DeVilbiss Co.
Eclipse Air Brush Co.
Paasche Airbrush Co.

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Advance Paint Co.
Ault & Wiborg Corp.
Hilo Varnish Corp.
E. I. du Pont de Nemours & Co.
Lilly Varnish Co.
Oxford Varnish Corp.
Rockford Varnish Co.
The Sherwin-Williams Co.
The Stille-Young Corp.

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The De Vilbiss Co.
R. C. Mahon Co.

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The Leon J. Barrett Co.

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Advance Paint Co.

WOOD FINISHES
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James B. Day & Co.
V. J. Dolan & Co.
E. I. du Pont de Nemours & Co.
The Glidden Co.
Hilo Varnish Corp.
Jamestown Paint & Varnish Co.
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